

# WESTERN INDUSTRY



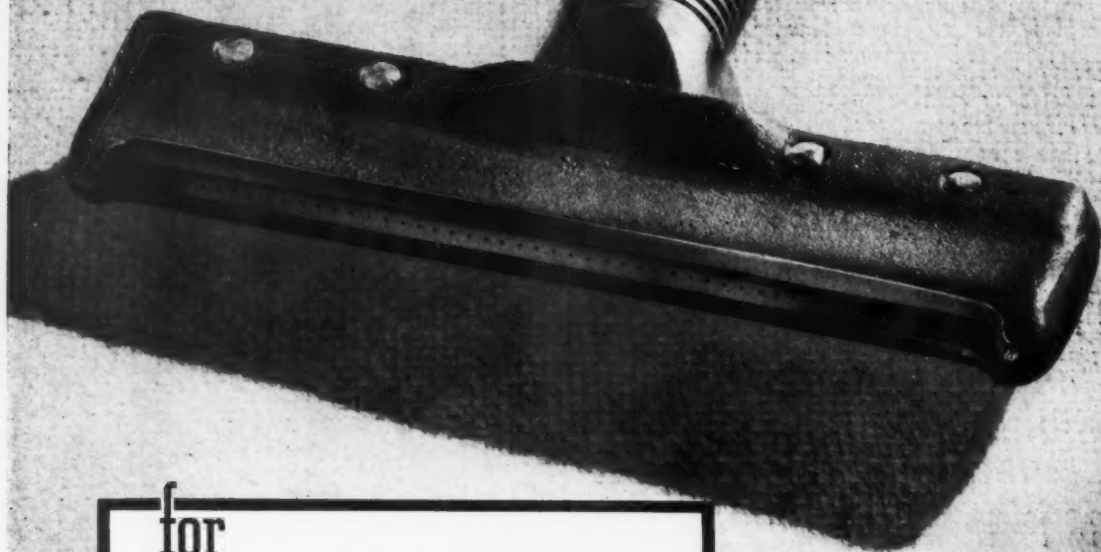
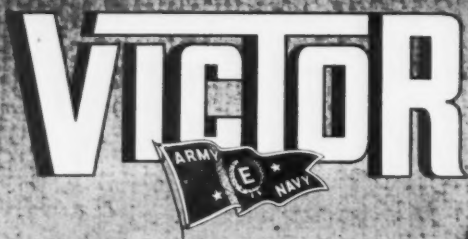
• Forging a round shaft on a 5,000 lb. steam hammer in one of the plants in the San Francisco Bay area.

Forty-Five Cents

VOLUME IX

NUMBER 9

September, 1944



## for FLAME PRIMING & DESCALING

### The Modern Method to Remove Rust Scales and Prepare for Subsequent Painting Is Descaling and Flame Priming

The process of descaling and flame priming is now established. To simplify these operations, we respectfully introduce the new Ribbon Flame Descaling and Flame Priming Torch. The standard models are obtainable in 4" (No. 361) and in 6" (No. 362) flame width.

Replaceable Meehanite skid shoes, Airadiator cooling section, and built-in *Spiral Mixer* and *Gas Proportioner* assure long service life, freedom from back-firing and best obtainable flame characteristics.

For inaccessible places or rivet heads, Circular Multi-Flame Nozzles are available.

*VICTOR welding torch owners require only the attachment.*

**VICTOR EQUIPMENT COMPANY**  
844 FOLSOM STREET · SAN FRANCISCO 7



*The new Victor  
Flame Priming and  
Descaling Nozzle  
for faster and better  
operation.*

Ad No. 82

**DISTRIBUTING POINTS FROM COAST TO COAST**

check this new development for

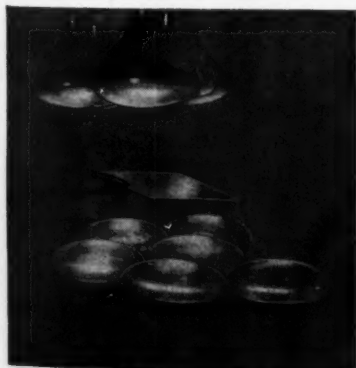
## INTRICATE SHAPES FROM FLAT SHEETS

WITH MICARTA "444"

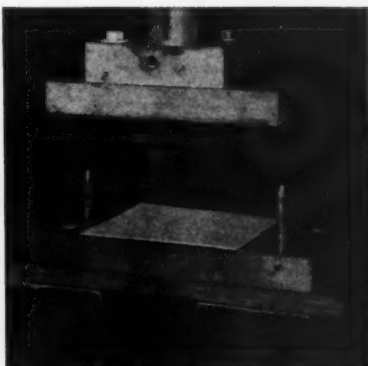
Micarta "444"—a new development in manufacture—now offers a new, practical and economical means for forming structural shapes from completely cured flat sheets . . . with low-cost equipment, and dies of non-critical materials. Shapes like those shown can be produced easily and quickly—in most cases with inexpensive wood molds and by use of a simple arbor press. Deep draws, sharp bends and intricate shapes may be obtained. Parts produced are strong, stable and permanent.

Originally developed for aircraft needs, Micarta "444" is being used for trim tab fairing, fuselage tail-wheel housings, ammunition feed chutes, and for many other practical applications. It provides characteristic Micarta properties of strength with lightness, and resistance to heat, cold, humidity and chemicals. Investigate the full story—write for the new Micarta Data Book B-3184-A. Westinghouse Electric & Mfg. Co., 1 Montgomery St., San Francisco, Calif., Dept. WI-2.

# Micarta



**JUST HEAT . . .** Premolded and cured flat sheets are heated uniformly on both sides by infrared lamps, ovens or parallel hot plates to just under the blistering point.



**INSERT . . .** Heated sheet is then placed in inexpensive wood mold in arbor press or where pressure can be applied to molds.



**AND FORM . . .** Pressure at approximately 100 pounds per square inch is applied, and shape left to cool briefly in mold. Resulting shape is permanent.

## Look to Western Asbestos for the answer to your insulation problem

...for piping, boilers, industrial equipment and refrigeration

THIRTY-SIX YEARS' SERVICE to Western Industry has given our organization a most valuable and complete background in the insulation field. It is this experience that enables us to offer a highly dependable service...a service that can meet the wide variety of conditions of insulation requirements.

Because, for any specific service there is one type and form of insulation that will serve better, more economically, than any other, we

maintain a local stock of the complete line of Johns-Manville insulating materials. These quality materials are installed by workmen thoroughly trained in applying insulation.

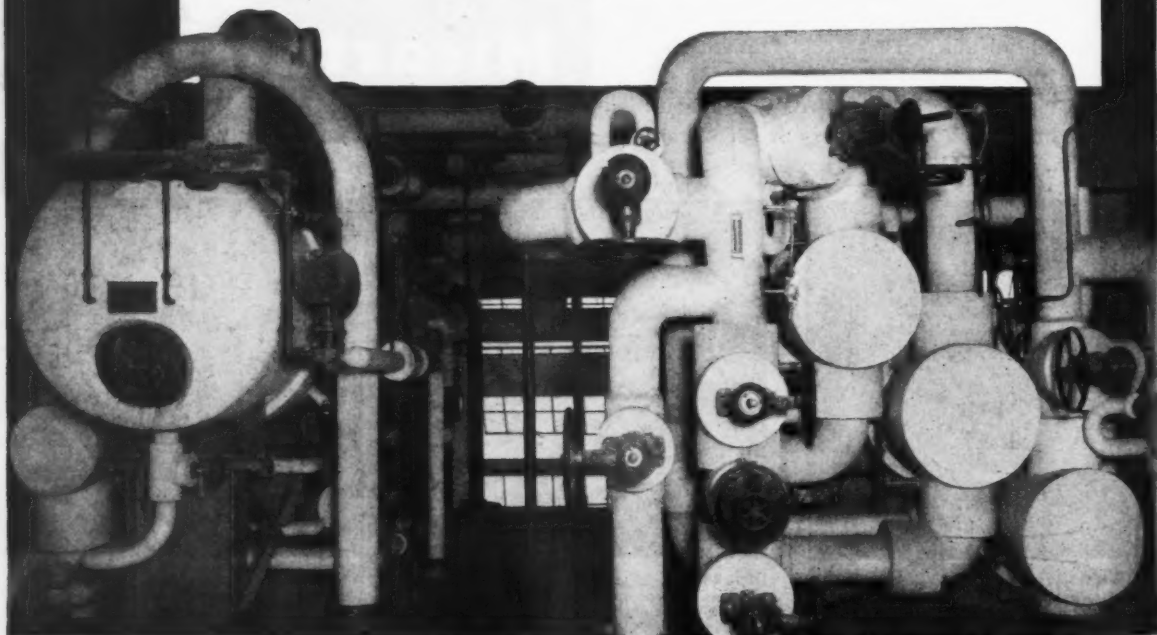
We are able to offer practical recommendations in choosing, for a specific insulation requirement, the material that will be most effective in reducing operating costs and increasing operating efficiency. Your inquiry on any insulation problem is welcome.

*Distributors for Johns-Manville Corporation*

## WESTERN ASBESTOS CO.

*Engineers and Contractors*

SAN FRANCISCO, OAKLAND, RICHMOND, SACRAMENTO, CALIFORNIA





## EDITORIAL COMMENT

# WESTERN INDUSTRY

### Needless Worry

YEARS that the rest of the country will get a big headstart on postwar markets while the West is still concentrated on war production presuppose a clear line of division which begins to disappear on closer inspection.

In the first place, inertia will keep many manufacturers, both East and West, on war contracts long after they have been given opportunity to resume civilian production. It is one thing to "view with alarm" the prospect of the West remaining in a war economy while Japan is being mopped up while manufacturers elsewhere reap a big harvest; it is quite another to turn one's back on a sure-thing government contract in favor of entering a competitive market where money must be spent on sales effort and the risks are many.

Secondly, Eastern manufacturers are very likely indeed to insist that they be given at least their rightful share in government contracts that are likely to run on for a long time after the war. Certainly our Navy will continue to be a tremendous establishment for a long time to come, regardless of what happens to the Army, and Navy business will also continue to be an important matter.

In the third place, the manufacturing required to support war with Japan after Germany has been disposed of cannot be concentrated in one area. It spreads all over the country. Tanks, trucks and other motor vehicles are principally manufactured in the East and Middle West. So are artillery, rifles and ammunition, uniforms, shoes and thousands of other articles required by both land, sea, and air forces. Aircraft and shipbuilding are not likely to be confined to the West, even if the plants on the Pacific Coast could provide all the output needed for finishing the war with Japan.

Although manpower on the West Coast is at present almost entirely channeled into war production, it seems reasonable to expect that there will be a gradual release in due course of time. In the whole matter it might be well to recall the old saying "Today is the tomorrow you were worrying about yesterday."

### N.A.M.'s Sales Job

SPEAKING optimistically, the N.A.M. mass meeting in Los Angeles to sell labor on the virtues of private enterprise was a "noble experiment"; speaking frankly, it was a failure, with all due respect to Frederick C. Crawford and his magnetic story of what he has accomplished in labor relations in his own plants. Just as in selling anything else, the value of the proposition has to be translated into dollars and cents before the prospect responds, and labor is not going to respond to vague word pictures. The N.A.M. or any other group of employers will have to get down to earth if they hope to stem the tide of governmental and union influence.

Government and the unions hold out tangible promises of benefits in the way of security and income, the things in which every man, high or low, is most vitally interested. Meanwhile industry fumes, fusses and fritters away its time, instead of showing specifically how all these benefits must be paid for by labor as well as management. No one ever buys anything merely because the seller runs down his competitor; the seller has to awaken the desire of the buyer for his product. Has the N.A.M., as an organization, failed to realize what each of its members individually know they must do to get orders for their merchandise? In regard to labor relations, let its officials ask themselves two questions, (1) have we something to sell? (2) have we described it in language that will make a sale?

## CONTENTS FOR SEPTEMBER, 1944

Editorial Comment . . . . .	5
Spotlight on the News . . . . .	25
Postwar Pledges Needed to Maintain Output . . . . .	27-29
Western Gear's Application of Production Control System . . . . .	30-32
Building Morale in an Arizona Mine . . . . .	33
Plywood Box Cars Arrive . . . . .	34
Air Control—Over Fumes, Gases, Vapors . . . . .	35
Battery Recharging on Assembly Line Basis . . . . .	36
Arsenic Action on High-Speed Bearings . . . . .	37
Bond of Plastics and Plywood Cemented at Seattle Meetings . . . . .	38-39
Washington Correspondence . . . . .	40-42-44-46
Westerners at Work . . . . .	48-50
March of Time in the Columbia Empire . . . . .	52-54-56
In Our Mail Box . . . . .	58-59
Efficiency Kinks from Western Plants . . . . .	60-62
Industry in Review, Tehachapi to Tijuana . . . . .	64-65
Labor and the Industrial West . . . . .	66-67
The Western Outlook—News and Statistics . . . . .	68-69
Opportunity Section . . . . .	70
The West On Its Way . . . . .	71-77
Western Trade Winds . . . . .	78
The Showcase . . . . .	79-80
Yours for the Asking . . . . .	81-82
Advertisers' Index . . . . .	82

### OUR COVER PICTURE

• The most spectacular aspect of the development of heavy industry in the West is the two big steel mills, but of equal importance is the growth of foundries, forge shops and metal working plants of other kinds, which have been working night and day for three years to supply sub-assemblies and parts for the shipyards and other prime contractors. Some of these plants date clear back to World War I, and the American Forge Company at Berkeley, a scene in whose plant appears on the front cover, is one of them.



Member Controlled Circulation Audit

25¢ PER COPY

\$2.00 PER YEAR

### Published by King Publications

503 MARKET STREET SAN FRANCISCO 5, CALIF.

A. C. PRENDERGAST, Editor

Washington Office: ARNOLD KRUCKMAN, Associate Editor, 1120 Vermont Ave., N.W., Washington 5, Telephone: District 8822.

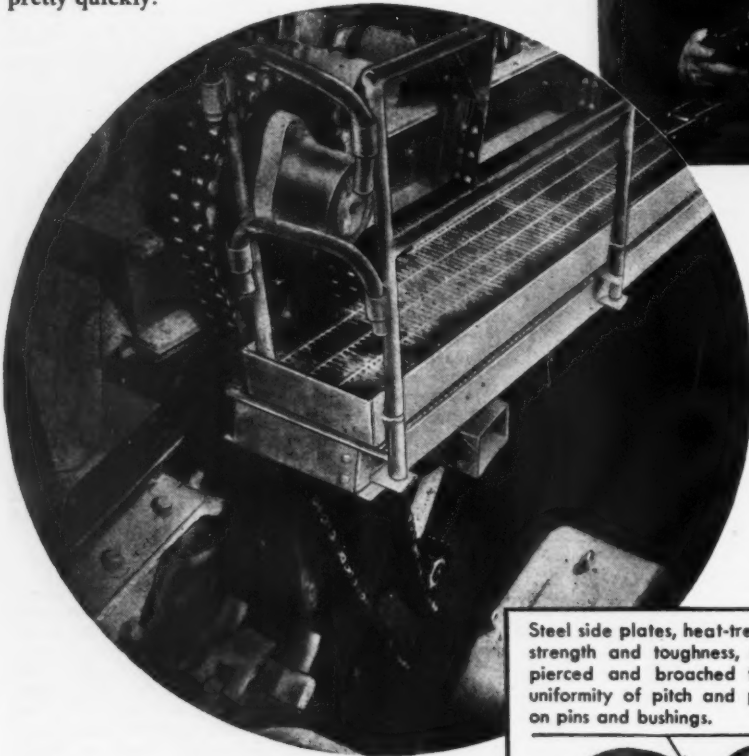
Los Angeles Office: JACK O. HODGES, Southern California Editor and District Manager, 479 South Holt Avenue, Los Angeles 36, Telephone: BRadshaw 2-3935.

Chicago Office: A. C. PETERSEN, District Manager, 5833 S. Spaulding Avenue, Chicago 29, Telephone: PRospect 1685.

Copyright 1944 by King Publications

# THIS CHAIN BELT SHOULDERS HEAVY LOADS

**① WORKING IN CEMENT MILLS**, sand and gravel plants, or quarries, a chain belt drive really gets acquainted with heavy loads. Rex Roller chain belts are designed and built to shoulder these heavy loads and come up ready for more—to deliver positive power in this severe service where design and manufacturing flaws show up pretty quickly!



**③ NOTE THIS CLOSE-UP.** It tells the story of why Rex Roller chain belts have the strength and toughness for cement mill service. Only the highest quality workmanship and materials go into the manufacture of these chains. For strength, compactness and high efficiency, it has no equal. Made in manufacturers' standard sizes, in single, double and other multiple strands.

\* \* \*

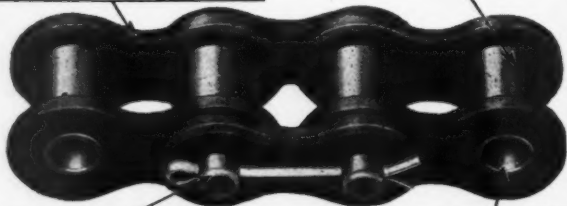
*Rex Roller chains are the answer to almost any problem involving positive transmission of power under heavy loads. The Rex Man can help you with your chain belt application problems. And for engineering data on Rex Chain Belts, ask for the 768-page catalog 'No. 444. Chain Belt Company, 1723 West Bruce Street, Milwaukee 4, Wisconsin.*



**② FOR INSTANCE**, the Rex Roller chain drive in this cement mill knows what heavy loads mean. It drives the apron feeder that carries rock to the crusher. The heavy shock loads on this equipment don't bother this chain belt. It keeps right on rolling without costly shutdowns.

Steel side plates, heat-treated for strength and toughness, blanked, pierced and broached to insure uniformity of pitch and press fits on pins and bushings.

Alloy steel roller heat-treated for extreme toughness and resistance to wear, then ground to size.



Alloy steel pin, case hardened, ground for accuracy, superior bearing surface. Shorter pitch chains furnished with riveted construction.

Alloy, case hardened steel bushing ground for accuracy and press fits in side bars.



## CHAIN BELTS

More than 2000 sizes and types for the positive transmission of power, timing of operations and conveying of materials.

## CHAIN BELT COMPANY OF MILWAUKEE

Rex Chain Belt and Transmission Division, Rex Conveying and Engineering Products Division, Milwaukee 4, Wis. • Baldwin-Duckworth Chain Belt Division, Springfield 2, Mass.; Worcester 3, Mass.

WOMEN OPERATORS SAY

"Thumbs Up!"\*

TO THE NEW *Thor*  
"ARMORED IN PLASTIC"  
1/4" ELECTRIC DRILLS

\*Studies show that the natural grip of most women operating a small drill is the "thumbs up" one pictured here. The handle of THOR's "plastic" drill is especially designed to make the most of this trait.

The "thumbs up" grip that women generally use in operating the new Thor "Armored in Plastic" drill also expresses the way they feel about this remarkable new tool—they like it!

**They like its 14% less weight!** With housings of light but sturdy "Thorite" plastic, these heavy duty portable electric drills weigh fully 14% less than previous types. That means less fatigue and greater productivity.

**They like its new handling ease!** The perfect balance and trim lines of the new Thor drills, plus the "kind" feel of the plastic housing itself, provide handling ease never before possible.

**They like its cooler operation!** The new Thor "plastic" drills run cooler for two reasons. The

plastic "Armor" is a non-conductor of heat. The oversize Thor fan and ample intake and exhaust slots circulate generous amounts of cooling air through the machine.

**They like its greater power!** The new Thor "Plastic" drills, powered by the famous Thor high torque, over-capacity motor, develop more power per pound.

**You, too, will like the way these new Thor "Armored in Plastic" portable electric 1/4" drills point the way to top speed production.** If yours is a war industry, Thor's *quantity output* will enable you to get them *quickly!* Ask for full details.

"Tools are weapons—treat 'em right."



*Thor*

Portable Pneumatic and Electric Tools

INDEPENDENT PNEUMATIC TOOL COMPANY



600 W. JACKSON BOULEVARD, CHICAGO, ILL.  
Branches in Principal Cities

chain  
what  
apron  
rusher.  
equip-  
belt. It  
costly

ed for  
istance  
e.

bushing  
ress fits

LTs

transmission  
materials.

K E E

rcaster 3, Mass.

## Measuring Up 50 Years Of Pump Making



A yardstick 3,000 miles long—stretched between Alaska and the Equator—would just begin to measure the thousands of Axelson deep well plunger pumps built during the last half century. Since Axelson's first oil well pump was produced in 1898, wells have constantly increased in depth—demanding better and better pumping performance. Axelson, pioneering many forward steps in pumping progress, has increased precision in ratio to increasing well depths—year after year—making the name AXELSON stand for quality wherever oil men demand top performance on tough pumping jobs.

Intimate care in all manufacturing processes—from drawing board to final inspection—makes Axelson deep well pumps **DEPENDABLE**. Axelson plungers, straight as a beam of light, work in the liners with minimum friction and wear. Liner assembly with minimum friction and wear. Liner uniformity and accuracy is insured by special tooling. Similarly, balls and seats must be machined to absolute accuracy to pass their rigid vacuum test.

Oil producers who "know"—say "yes" to Axelson deep well pumping equipment. Measure for yourself the benefits of Fifty Years of pump making—use AXELSON pumps and sucker rods!

**AXELSON MANUFACTURING CO.**  
PLANTS: ST. LOUIS, MO. (Main Office)  
LOS ANGELES, CALIF.  
ST. LOUIS, MISSOURI

OFFICES: SAN FRANCISCO, CALIF.  
PITTSBURGH, PA.  
DALLAS, TEX.  
HOUSTON, TEX.  
MEMPHIS, TENN.  
NEW ORLEANS, LA.  
NEW YORK, N.Y.  
PHILADELPHIA, PA.  
RICHMOND, VA.  
ST. LOUIS, MO.  
WASHINGTON, D.C.  
WICHITA, KAN.



**AXELSON**  
DEEP WELL PLUNGER  
PUMPS  
AND SUCKER RODS

Simplicity in art work and layout combine with a convincing (because it's practical) type of sales argument in this page advertisement developed for our client, Axelson Manufacturing Company. It is one of a current series of effective vehicles created to tell oil men that Axelson pumping equipment has stood the grueling test of time... and has steadily improved under it!

In such 2-color advertisements, Axelson is also performing a patriotic service to the petroleum industry as a whole, by telling it how to meet the necessarily greedy demands of war on the home-front, as well as on the battle-front.

→ **PLANNED**  
→ **PREPARED**  
→ **PLACED BY**

Industrial Advertising has its own way of helping win the peace. No flag waving. No fanfare. Just the stimulating force of presenting hard, cold, *specific* facts vital to our great industrial present and even greater future. The McCarty Co. is proud to be the west's oldest and largest industrial advertising agency.

## THE McCARTY COMPANY

*A Complete Industrial Advertising Service Since 1919*

LOS ANGELES 15, BENDIX BUILDING • SAN FRANCISCO 5, RIALTO BUILDING  
PITTSBURGH 19, KOPPERS BUILDING • FORT WORTH 2, DAN WAGGONER BUILDING  
MEMBER...AMERICAN ASSOCIATION OF ADVERTISING AGENCIES



# Efficient, High-Capacity Handling with LINK-BELT BELT CONVEYORS



## Anderson Ranch Dam

... is a U.S. Bureau of Reclamation Project located on the South fork of the Boise River, approximately 71 miles from Boise, Idaho. Low cost handling of excavated material in a continuous stream, with minimum attendance and elimination of rehandling is accomplished on this job with Link-Belt Conveyors. These conveyors extend along the edge of mountains and carry earth through several tunnels from the borrow pit, located 2 miles away. They all employ Link-Belt Anti-Friction Idlers and welded steel terminal pulleys. Rubber-tread impact idlers are employed at conveyor loading points to absorb shock, and self-aligning idlers located at proper intervals along both the carrying and return runs, automatically serve to keep the conveyor belt in line.

### LINK-BELT COMPANY, Pacific Division

General Office  
and Plant



400 Paul Ave.  
San Francisco 24,

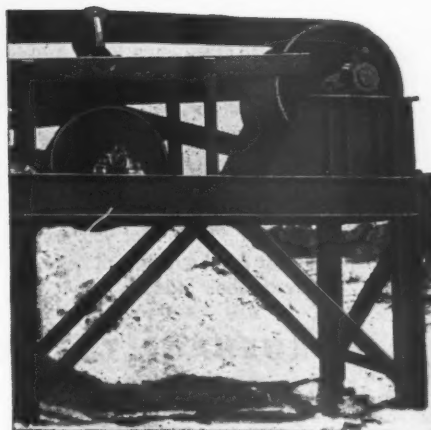
Factory Branch Offices and Warehouses:

Los Angeles 33, 361 S. Anderson St.—Oakland 7, 1025 Harrison—Seattle 4, 820 First Ave. S.  
Spokane 8, South 151 Lincoln St.—Portland 9, 1637 N.W. 14th Ave.

**LINK-BELT**  
**BELT CONVEYOR EQUIPMENT**  
IDLERS • TRIPPERS • BELTS • PULLEYS • BEARINGS • DRIVES



You can be assured of maximum belt life, minimum power and maintenance cost, and dependable trouble-free service with Link-Belt Anti-Friction Belt Conveyor Idlers and other equipment. Link-Belt engineers pioneered in the development of anti-friction belt conveyor idlers and have consistently improved the original, fundamental design—the grease seal, bearing adjustment, shaft mounting and the supporting stands and brackets. All with the result that today's Link-Belt designs offer the very best in belt conveyor equipment.



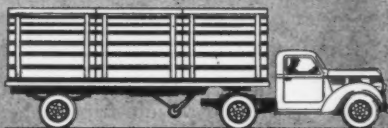
**Shasta Dam** . . . All 163 end-pulleys (38" face for 36" wide conveyor belts) for conveyors for Shasta Dam to handle sand and gravel, were of the Link-Belt welded steel type. The picture above shows two of these in service on one of the 26 individual conveyors which make up the conveying system. All the head pulleys are rubber-lagged, 48" diameter. Many are mounted on 5-<sup>15</sup>/<sub>16</sub>" diameter shafts, and all are furnished with heavy-duty bearings.

9497-P

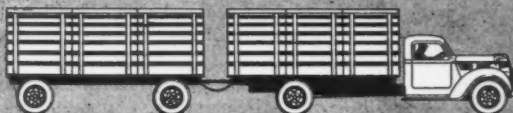
# HERE'S WHAT A 1½ TON TRUCK CAN really HAUL



AS A  
TRUCK 2½ TO 4 TONS



AS A  
SEMI-TRAILER 6 TO 9 TONS



AS A  
TRUCK-TRAILER 9 TO 12 TONS

If you can't buy more trucks, then why not let each truck pull a Trailer in addition to its own load? Or, convert it into a Truck-Trailer with a much larger capacity.

ODT officials and truck operators agree that in these days of equipment shortages a Trailer should be added to every truck that can haul it. Today's trucks are built with plenty of power to spare... they can pull 2 to 6 times more than they can carry. Trailers also use less critical materials. If you're not making full use of your truck's horsepower, consult your nearest Fruehauf Branch to see what can best be done to increase their load capacity.

World's Largest Builders of Truck-Trailers

## FRUEHAUF TRAILER COMPANY

Western Manufacturing Plant—Los Angeles

Portland  
Phoenix  
Los Angeles

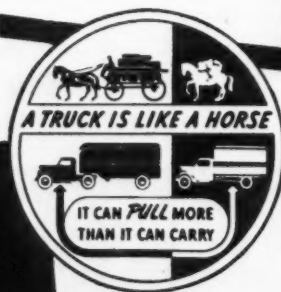
Sales and Service Branches

Fresno  
Salt Lake City  
Seattle  
San Francisco

San Diego  
Denver  
Spokane

### FRUEHAUF TRAILERS ARE AVAILABLE

Consult your Fruehauf Branch to determine your specific needs, then apply for a Certificate of Transfer by filing application form WPB663 (formerly PD310). Your Fruehauf Branch will gladly help you make application.



# FRUEHAUF TRAILERS



## Now! Save time, money with this all-purpose grease!

Many manufacturers today who are using all-purpose UNOBA grease have been able to dispense with as many as five different greases which they formerly needed to lubricate their equipment.

This remarkable *barium* grease, developed by Union Oil Company, is used successfully in shipyards, rubber mills, steel mills, magnesium plants, lumber mills, canneries, aircraft plants and various other industrial plants on the Pacific Coast. These industries have found that the unusual versatility of UNOBA

enables them to use it for practically every lubrication requirement where a grease is specified.

UNOBA will not wash off in the presence of water or steam. It will give effective lubrication at temperatures in excess of 250° F. It offers exceptional protection against rust and corrosion.

UNOBA is unexcelled for grease

lubrication. It does not "set" or harden with age and protects even wet, hot bearings for longer periods of time than any other lubricant!

Why not save time and money with this *one all-purpose* grease?

Your local Union Oil dealer will be glad to deliver a supply to you — or write Union Oil Company, 617 W. 7th St., Los Angeles 14, California. Ask for UNOBA — another of the 492 quality petroleum products sold by Union Oil Company from Alaska to Panama.

**UNOBA**



**No. 5** of a series  
by SYLVANIA  
for all users of  
fluorescent lighting

# Fluorescent operating hints



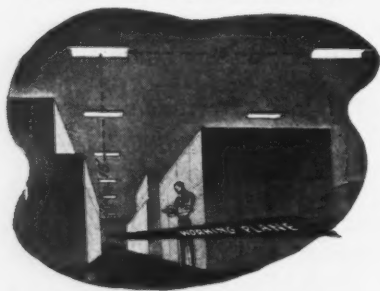
## HOW TO GET THE RIGHT LIGHT FOR THE JOB

The lighting engineer plans illumination according to the work it lights. He can do much to help you get the right fluorescent light for top visual efficiency.

Size of lamps, spacing of fixtures, color of walls and ceiling, mounting height, size of area—all these factors determine intensity of illumination. The amount of light at the *working plane* is measured in *foot-candles* by means of a lightmeter.

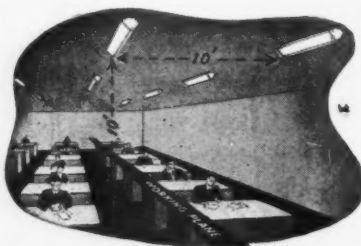
## TYPICAL INSTALLATION EXAMPLES

*Based on Recommended Minimum Standards of Illumination by the I.E.S. (Illuminating Engineering Society)*

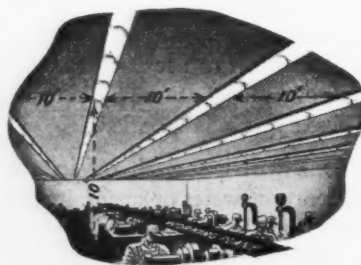


**Ten** foot-candles of illumination can be used for some types of rough assembly, molding clay products, tanning leather, grinding grain, general indoor

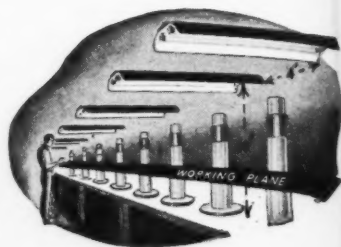
construction, lobbies, corridors, elevators—lighting for traffic safety. Individual industrial fixtures spaced 15 feet apart, as shown at left, give this level in a typical stockroom.



**Thirty** foot-candles are needed for top efficiency in office work. This intensity of light also is recommended for sugar and flour grading, medium bench work in machine shops, photo-engraving blocking, hand casting in type foundries, warping dark woolens, and pressrooms. Individual shielded commercial fixtures are arranged here to give this illumination in a typical office.



**Fifty** foot-candles give adequate light for many types of fine assembly work, fine glass grinding and polishing, inspection, silk and cotton warping, stitching light materials, and automobile assembly. Continuous row of fluorescent fixtures at this height above a bench will do the job.



**One hundred** foot-candles of light are concentrated on this inspection bench for checking 1/10,000 of an inch tolerances. This high level of illumination also is required for such painstaking jobs as tint-laying in engraving, watch manufacturing, fine proof-reading, and show windows in secondary business districts. Close spacing of fixtures, as shown, pays in better work.

When you plan special fluorescent installations, avoid too much brightness contrast between localized bench lighting and the general lighting system. It makes for eye-fatigue and a drop-off in efficiency. For example, if 100 foot-candles are needed at a specific inspection bench, there should be about 25 foot-candles of general illumination in the rest of the room. This suggests a 4 to 1 rule of thumb.

## MORE DETAILED INFORMATION—FREE

This folder contains a chart of I.E.S. Recommended Minimum Standards of Illumination for more than 200 different kinds of work—fluorescent priority information—cases of how the right fluorescent light for the job helps industry—tips on obtaining better lighting from your present fluorescent installations. Yours for the asking. Just write to Sylvania, Boston Street, Salem, Mass.



# SYLVANIA ELECTRIC PRODUCTS INC.

*"Fluorescent at its Finest"*

555 So. Flower St.  
Los Angeles 13, Calif.

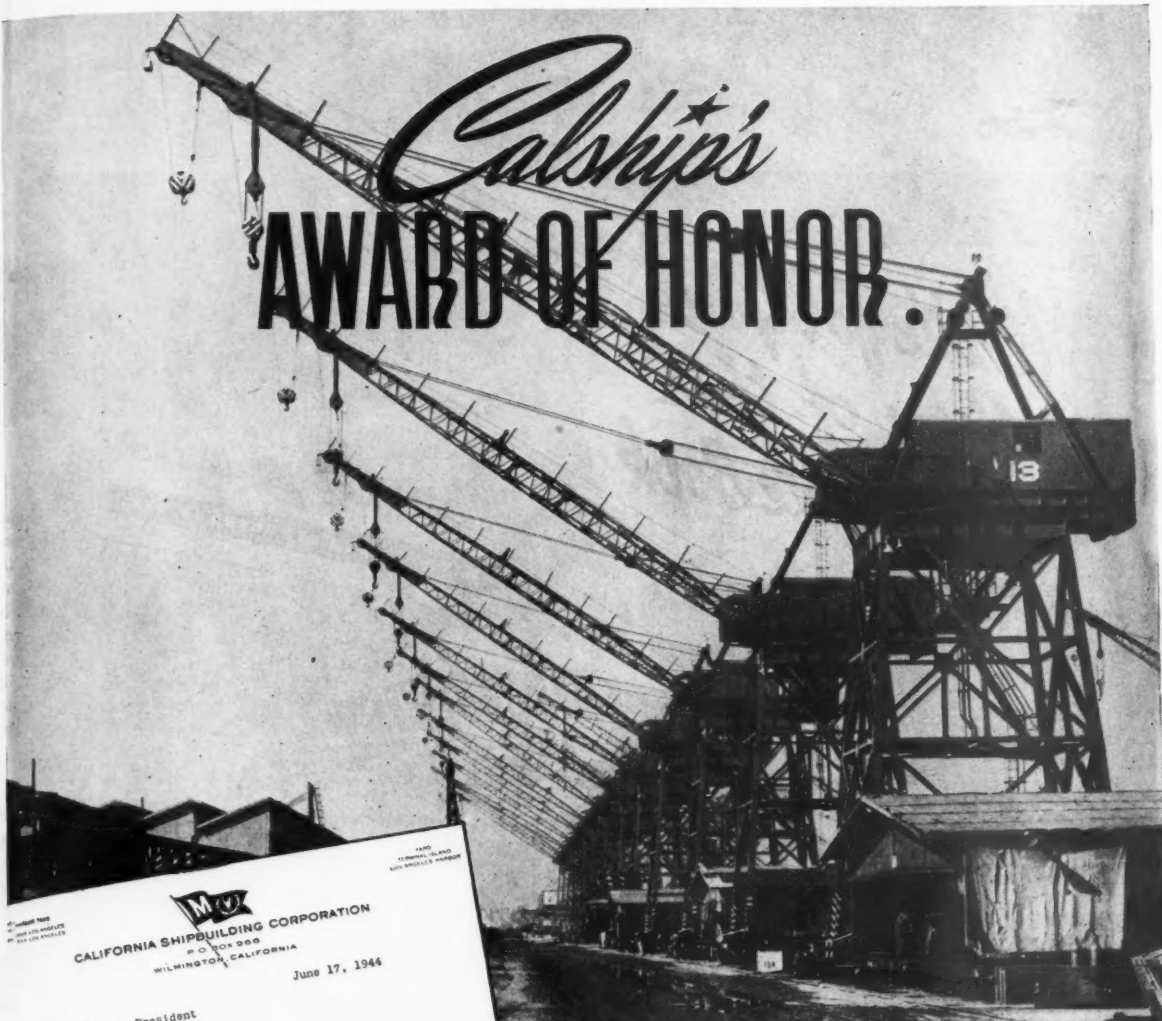
111 Sutter St.  
San Francisco 4, Calif.

4424 White-Henry-Stuart Bldg.  
Seattle 1, Wash.

FLUORESCENT LAMPS, FIXTURES AND ACCESSORIES, INCANDESCENT LAMPS, RADIO TUBES, CATHODE RAY TUBES, ELECTRONIC DEVICES



# Calship's AWARD OF HONOR.



**CALIFORNIA SHIPBUILDING CORPORATION**  
WILMINGTON, CALIFORNIA

June 17, 1944

Mr. M. R. Colby, President  
Colby Steel & Engineering Co.  
525 Central Building  
Seattle, Washington

Dear Sir:

The California Shipbuilding Corporation has been presented the  
AWARD OF HONOR FOR DISTINGUISHED SERVICE TO SAFETY by the  
National Safety Council for the outstanding record established  
here in the reduction of accidents.....

Thirty-six COLBY cranes are in almost continuous operation  
within the plant, thirty of which have been used for over  
three years and the remaining six for approximately one year.  
During this time, we have not had an accident caused by the  
mechanical failure of a COLBY crane. We have not had an ac-  
cident caused by the failure of a COLBY crane to respond  
properly to the operator's control. This dependability and  
worth of the COLBY cranes has been an important factor in the  
safety records established here.

Very truly yours,

CALIFORNIA SHIPBUILDING CORPORATION

By

*J. Jones*  
Assistant Production Manager

# COLBY

## STEEL AND ENGINEERING COMPANY

HEAD OFFICE: 525 Central Building, Seattle 4, Washington

15 Park Row  
NEW YORK CITY

417 Market St.  
SAN FRANCISCO 5

Birks Building  
VANCOUVER, B. C.

Affiliated Companies: PRESCOTT IRON WORKS, AMERICAN FOUNDRY CO., Seattle

Write for Your  
Copy of this  
Valuable Book



## 48-PAGE PICTURE RECORD of typical jobs TIMBER STRUCTURES has done for AMERICAN INDUSTRY

"ENGINEERING IN WOOD" is a documented record of the importance of timber in building, and the type and kind of work performed by Timber Structures, Inc. for industry and government before and during the war.

The book is packed with photographic and word illustrations on the use of ring-connected timber trusses, columns, arches, and heavy framing in buildings ranging from small stores to huge industrial plants.

Examples have been chosen from these fields: Aviation, Bridges, Shipyards, Municipal, Industrial, Commercial, Specialties; with a special section on the techniques of Glued Lamination.

Contractors, architects, engineers and plant management men will find

- "Engineering in Wood" a worth-while addition to their reference and work files on current and post-war construction planning.

- For your free copy, simply fill in and mail the coupon or send a request on your letterhead.

- Prompt arrival of the book will be insured by addressing the Timber Structures office nearest you.

**TIMBER  
STRUCTURES**  
INCORPORATED  
ENGINEERING IN WOOD

Portland 8, Oregon New York 17, N.Y.  
Eugene, Oregon Seattle 4, Washington

MAIL  
COUPON FOR  
LITERATURE

**TIMBER STRUCTURES, Inc.**  
Send Book "Engineering in Wood"

Name

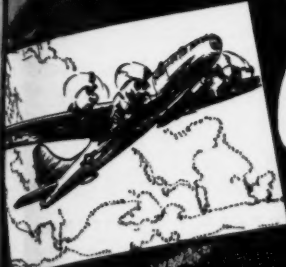
Address

Type of building or business...

If west of the Mississippi, send to Portland 8, Oregon. If east of the Mississippi, send to 335 Fifth Avenue, New York 17, N.Y.

# Gearmakers

AL WORLD



MARINE



PAPER



MINING



OIL

PACIFIC GEAR  
& TOOL WORKS  
1035 Folsom St.  
San Francisco, Calif.

Gears of all types and sizes are precision-cut in Pacific-Western's four modern, completely equipped plants. Large or small . . . one or many, Pacific-Western produces gears and geared products of extremely high accuracy. For more than half a century we have been perfecting gear details to assure reliable performance and longer life for Pacific-Western geared products.

Soon, we will be returning to the manufacture of peacetime gears . . . will be seeking out . . . welcoming the "tough" jobs of postwar power transmission problems. Then Pacific-Western, in peacetime as in war with ingenuity and skill, will continue to serve Western industry . . . Helping to make the West greater, stronger than ever before.

## WESTERN GEAR WORKS

417 9th Ave. South  
Seattle, Wash.

11181 Long Beach Blvd  
Lynwood, Calif.

**PACIFIC  
WESTERN  
GEAR  
PRODUCTS**



PLANTS: SEATTLE, LYNWOOD, VERNON, SAN FRANCISCO



# Acid-proof vest with 10,253 buttons

**SHOWN HERE** under construction is a refinery tower designed to remove undesirable tar materials from high-octane gasoline.

Because the steel shell of the tower will not withstand the corrosive action of separation acids, a chrome alloy lining was specified. 10,253 separate plug welds, each one impervious to acids and able to stand extreme pressures and tempera-

tures, were necessary to secure the tower lining.

An unusual fabrication job, it is another of the missions completed by Consolidated Steel Corporation for war industries and armed serv-

ices. It is an example of the craftsmanship Consolidated Steel will devote to the construction needs of peacetime America. Inquiries looking to future construction are solicited. Address the president.



## Consolidated Steel

FABRICATORS • ENGINEERS • CRAFTSMEN

CONSOLIDATED STEEL CORP., LTD., LOS ANGELES, LONG BEACH, WILMINGTON, CAL.; ORANGE, TEX.

LARGEST INDEPENDENT IN THE WEST



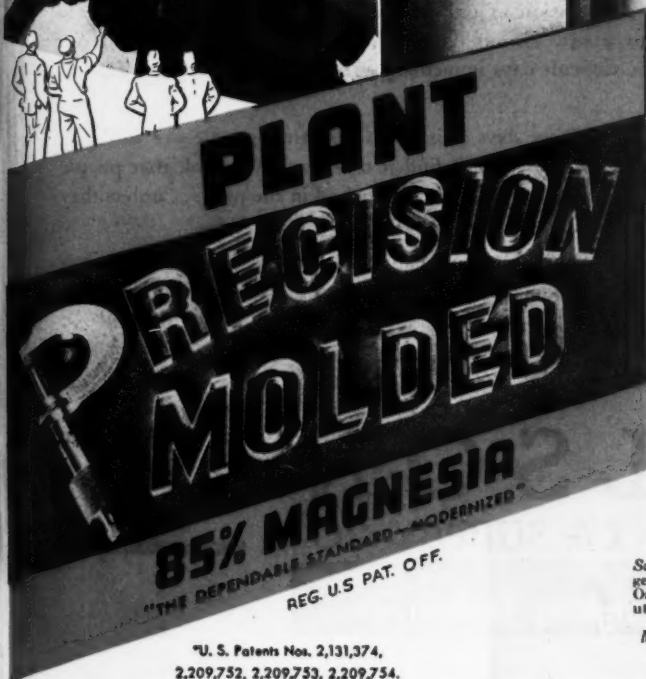
BUY ANOTHER  
WAR BOND TODAY



# GREAT "DUCTILE STRENGTH" AND DURABILITY IN THIS NEW LIGHT-DENSITY TYPE PRECISION MOLDED 85% MAGNESIA

• The Plant Precision Molded process\* builds new "Ductile Strength" right into 85% magnesia heat insulating material—so that it will resist shock from shipping, accidental dropping and rough handling during installation—and so that it will really hold

together even under severe vibrating service! • This new-type 85% magnesia likewise brings the advantages of unprecedented lightweight and lower thermal conductivity. It positively assures greater savings in fuel and heat, just as it assures faster, easier application and ultra-durability! Send now for complete descriptive data.



**PLANT  
RUBBER &  
ASBESTOS  
WORKS**

MAIN OFFICE: SAN FRANCISCO

Sales Offices in Los Angeles, Wilmington, and Oakland, Calif.; distributors in principal cities. Factories in Emeryville, San Francisco, and Redwood City, Calif.

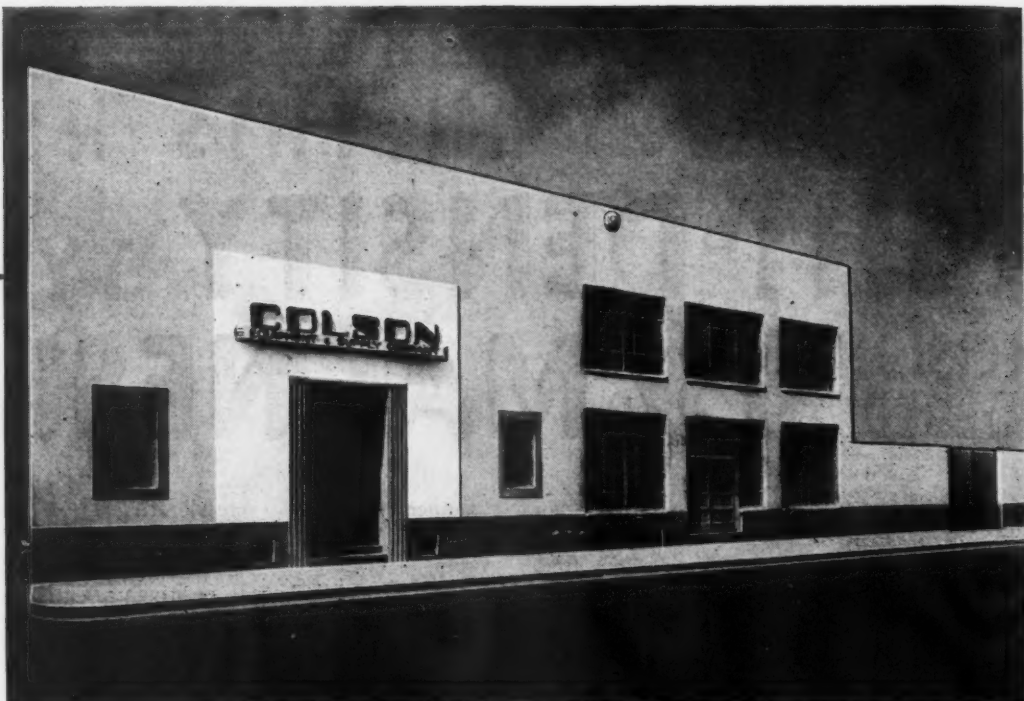
Manufacturers of Plant Insulating Materials and Mechanical Packings Since 1920

COMPLETE RANGES OF SIZES and thicknesses in blocks and pipe coverings (up to and including 18-inch pipe size in sectional form. Larger sizes in segmental form).



Army-Navy "E" Awarded to FACTORY No. 3 Emeryville, Calif.

\*U. S. Patents Nos. 2,131,374, 2,209,752, 2,209,753, 2,209,754.



## *"Back Home Again"*

**S**EVERAL months ago we had a disastrous fire. We were faced with the problem of taking care of people who needed the equipment that we had told them we would provide. And we were faced with the problem of rebuilding our factory at a difficult period.

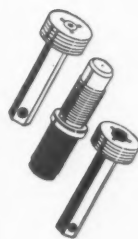
Through the splendid cooperation of our employees, we were able to establish temporary headquarters to carry on business. Through the cooperation of our factories in the East, we were able to offset some of the loss of production in our plant. Through the patience and understanding of our customers, we were able to "get through" the difficult days immediately following the fire with far less trouble than we would have imagined.

To everyone, we can only say, "Thank you." These days it is often said that people are too busy to be bothered with the other man's trouble, but we just didn't find it that way. We think that people are so busy with the war, that they don't have quite as much time as they had in the past . . . unless they find you are in trouble. Then they *take* time.

We're "back home again." We have better facilities than we had, and are able to do a better job than before. In fact, we think we're going to be able to make up for "lost time" as far as our contribution to the war is concerned. That's a way we can translate our "Thank you" into something we all want . . . that the phrase, "Back Home Again" be heard in homes throughout United States.

**COLSON**  
EQUIPMENT & SUPPLY CO.  
LOS ANGELES      SAN FRANCISCO  
Material Handling Equipment

# IT'S "GO" OR "NO GO"



## To "Ack Ack" the Rising Sun

Tojo's bombers don't like American anti-aircraft fire. And for good reason! On land or on sea, Yankee gunners are picking them off with disconcerting regularity. Behind this deadly accuracy and skill stands the uncanny efficiency of modern weapons. Scientific instruments that direct shells unerringly to their target miles in the sky are keeping the score in our favor.

Manufacturing anti-aircraft equipment and ammunition is a complex job. Component parts must be machined to exact specifications. Every piece of mechanism, no matter how small, must fit perfectly and work smoothly or failure at some crucial moment

may result. It is to insure the accuracy of these parts that Kobe's Master and Reference gages were designed. With them, the final inspector passes judgment and his "GO" or "NO GO" determines future performance on the firing line.

As with anti-aircraft equipment, so also with thousands of other weapons rolling from our production lines. Kobe gages are in use everywhere as the final authority when close blueprint tolerances must be strictly followed. There is no room for error with Kobe gages because they are as free from flaws and variations as science can make them. Machines and tools of utmost precision

guard each step in their manufacture. They are checked and double-checked by trained technicians on special instruments, some so sensitive they accurately record measurements to 10/millionths of an inch!

In addition to a variety of standard gages, Kobe's expanded facilities are also available for the design and manufacture of special types. These are produced to individual specification and for a wide range of uses where absolute accuracy is required. Though Kobe's gage operations are now largely devoted to war, it is developing through this experience new methods which will set the gage standards of tomorrow.



*Master and  
Reference*

**GAGES**

**KOBE, INCORPORATED**

3040 East Slauson Avenue • Huntington Park, California

FOR REDUCED  
DRESSER COST  
PER PIECE...



## ...ON A WIDE RANGE OF GRINDING WORK

For a wide range of rough, semi-finish and finish grinding work, you'll find the Diamond-Impregnated Carboloy Dresser gives uniform, trouble-free results at a substantial saving in dresser cost per piece. The Carboloy Dresser conserves diamonds, eliminates all remountings, can be reconditioned in 2 to 5 minutes and has an unusual ability to withstand accidental abuse. Three sizes. Immediate deliveries.

Send for  
catalog  
DR-100

### CARBOLOY COMPANY, INC.

Sole makers of the Carboloy brand of cemented carbides

11139 EAST 8 MILE STREET, DETROIT 32, MICHIGAN

Birmingham • Chicago • Cleveland • Los Angeles • Newark • Philadelphia • Pittsburgh • Thomaston, Conn.

Also sold by leading Mill Supply Distributors



Another  
USE FOR  
CARBIDES

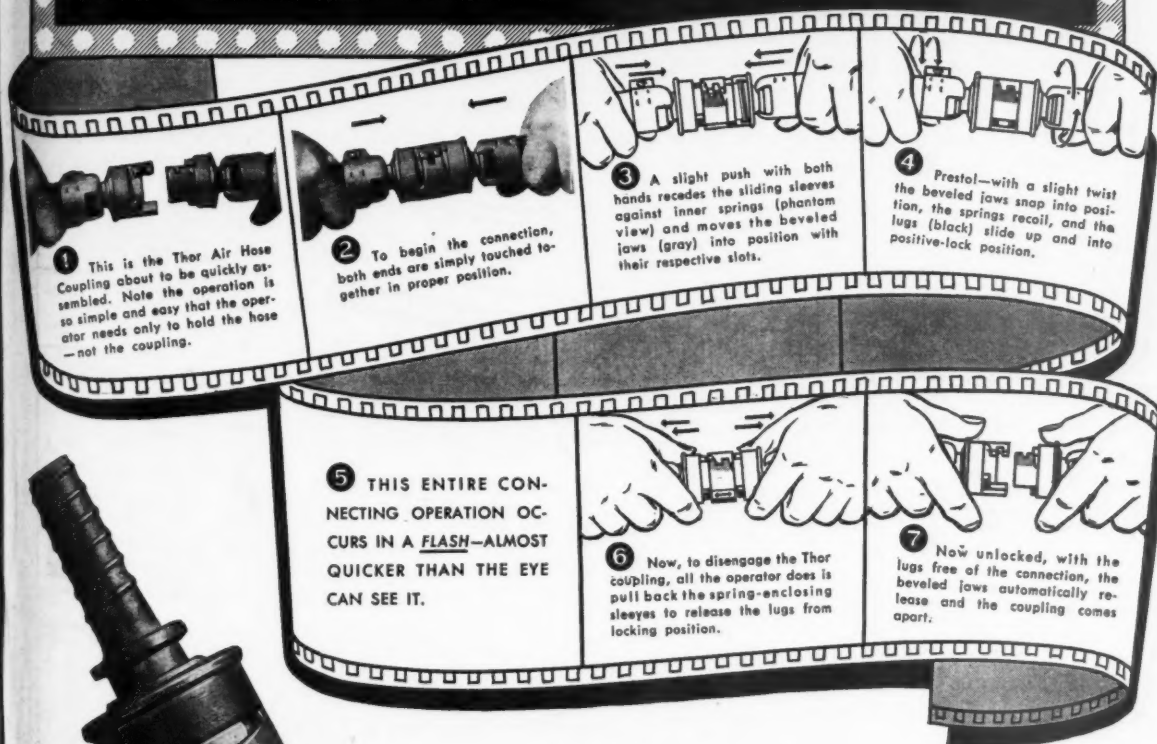
**CARBOLOY** CEMENTED  
CARBIDE  
**DIAMOND DRESSERS**  
IMPREGNATED

For  
GENERAL  
USE ON  
GRINDING  
WHEELS



# "WATCH THE LUGS!"

for the Simple Secret of  
SAFER, POSITIVE-LOCK *Thor* HOSE COUPLINGS



**Thor**  
HOSE COUPLINGS

... interchangeable between all sizes and combinations up to 1/4 inches, inclusive. Each hose end is identical with the other—no right or left... no male or female—making a universal coupling. Write today for complete information in Thor Catalog 42-A.

## SIMPLE? YES!

But in this simplicity of spring-operated locking lugs controlling the beveled jaws lies the *positive-lock* feature that makes the Thor Hose Coupling the safer... *perfect* connection. Easy to operate, this Thor coupling will save you both time and money.

Positively locked, it cannot be accidentally disconnected to endanger the operator of the tool. Even if one hose end strikes a snag and the sleeve slides back, the sleeve on the opposite side *stays in position* to retain the connection... *because the sleeves must be pulled in opposite directions simultaneously to disengage the locking lugs!*

**Thor**

Portable Pneumatic and Electric Tools

**INDEPENDENT PNEUMATIC TOOL COMPANY**



600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

# You name the Piping Service CRANE supplies the Equipment

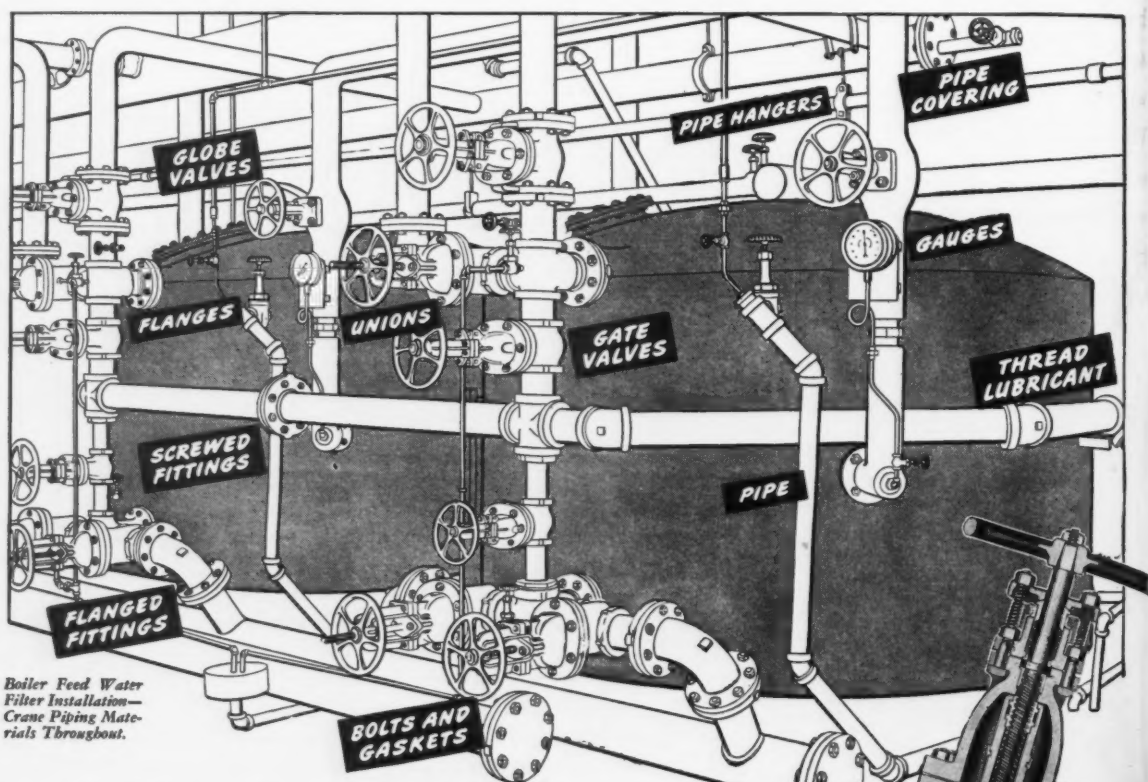
ONE SOURCE OF SUPPLY . . . ONE RESPONSIBILITY FOR ALL MATERIALS

Valves—fittings—pipe—fabricated assemblies—and piping accessories—for power or processing lines—high, moderate, or low pressure—all your needs for any installation are available from a single source: Crane. Just name the fluid to be handled—your Crane Branch offers the world's greatest selection of quality materials—in brass, iron and steel—for every piping service.

Better installations start with parts whose quality and craftsmanship are backed by a

single responsibility. Ordering, maintenance work, storing of parts and getting emergency replacements—all such steps are simplified by Crane *complete* materials service. Your satisfaction with Crane products is assured by Crane Co.'s 89-year experience and leadership in the piping equipment field.

CRANE CO., General Offices: 836 South Michigan Avenue, Chicago 5, Illinois. Branches and Wholesalers Serving All Industrial Areas.



Boiler Feed Water  
Filter Installation—  
Crane Piping Materials Throughout.

## ONE STANDARD OF QUALITY

For dependability throughout, specify the same high quality in every part of piping systems. Here, for example, is what Crane Iron Body Wedge Gate Valves add to your piping. Strong body sections resist severest line stresses. Straight-through ports give streamline flow. A deeper stuffing box lengthens packing life. Extra long guides keep disc travel true, while finest design in every part assures smooth, positive operation and long life.

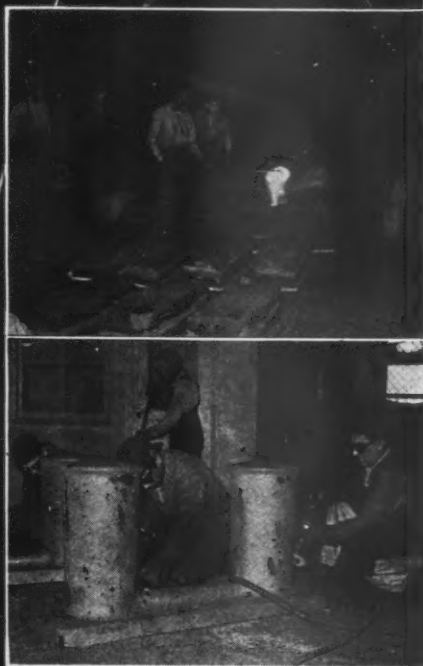
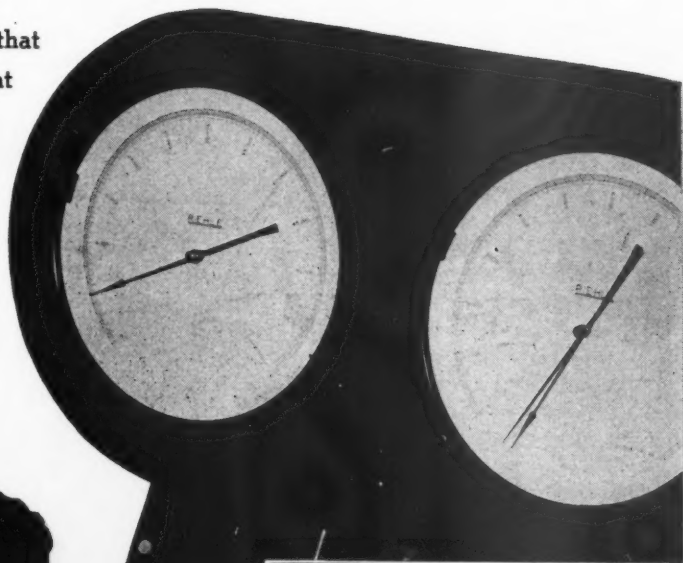
**STANDARD  
IRON BODY  
WEDGE GATE  
VALVES**

# CRANE

**VALVES • FITTINGS • PIPE  
PLUMBING • HEATING • PUMPS**

# Mr. Mars is a tough customer!

War demands materials...and men, too...that are strong and hard...and methods that make and keep them tough. Quisling short-cuts on quality don't go with Mr. Mars! And the new world we've got to build, to replace the old one that's being blasted into junk, will likewise call for new standards of quality... standards which will be easier to meet because we have learned to fill the exacting requirements of the world's toughest customer. When destruction stops and construction begins, we'll be the better builders because Mr. Mars has taught us how!



## Warman

**STEEL CASTING COMPANY**

Specialists on steel casting for over 32 years  
6100 SOUTH BOYLE AVENUE • VERNON, CALIFORNIA

Producers of all castable steels, including all the carbon steels, low alloys, special purpose and engineering steels, corrosion and heat resistant steels

"FAIRBANKS-MORSE SCALES — ARBITERS OF BUSINESS"



## The Decision Is Final!

Since 1830—Fairbanks-Morse Scales have been rendering split-second decisions recognized as *fair* and *absolute* by buyers and sellers alike.

They are accurate, reliable, honest weighing decisions that have exerted a profound influence on the progress of industries and the welfare of nations.

The accuracy and long life built into Fairbanks-Morse Scales can give you added protection—dis-

tinct *plus values* wherever fast—accurate—efficient weighing is essential.

They are tangible *values* developed and pioneered by a company that places no ceiling on whatever it takes to make the finest scales possible to produce.

Fairbanks, Morse & Co., 216 Fairbanks-Morse Building, Chicago 5, Illinois.



**FAIRBANKS-MORSE**

DIESEL ENGINES  
PUMPS  
MOTORS  
GENERATORS  
WATER SYSTEMS  
SCALES  
STOKERS  
FARM EQUIPMENT  
RAILROAD EQUIPMENT



Scales



# Spotlight

## on the NEWS

**WESTERN INDUSTRY**  
**FOR SEPTEMBER, 1944**

VOLUME IX

NUMBER 9

### Stemming the Ebb Tide

People, whether they operate turret lathes, welding torches, drafting pens, paint brushes, typewriters, or accounting machines, whether they supervise or manage others, are still people. They aren't like cans of tomatoes, to be moved around where needed or put on the shelf in storage if not required immediately. That is why the slogan "Let's win the war first" can't be carried out in toto, why every worker won't just stay hitched on a job that may not exist next year. Management in the West is making a definite effort to provide tangible assurances about future employment (p. 27) in the hope of stemming a drift away from the Pacific Coast that already has begun to have its effect on the production and repair of ships (p. 28).

### Preparations For the Future

Reports that people are leaving war jobs to get settled in a good spot for a service station or a store of some kind are substantiated by figures from the State Equalization Board of California (p. 28). Retail businesses of various kinds are showing a decided recovery, at least as far as number of establishments is concerned, from the low-water mark of January 1943. Preliminary reports received by the Federal Reserve Bank of San Francisco (p. 28-29) indicate that industry (excluding aircraft and shipyards), expects to reconvert to civilian production without great need of additional capital, but even so, there will be a big drop in employment from the present war peak, although the bottom should be considerably above the pre-war level.

### System vs. Snarls

All of the largest war plants have had to adopt, adapt or create production control systems or else bog down completely. But many of the medium or smaller-sized establishments have gotten themselves badly snarled up for lack of a system, although still managing to keep the wheels turning somehow. Others have saved themselves much trouble and money by an-

alyzing their problem and providing a set-up that would keep everything flowing smoothly. One of the latter concerns is Western Gear Works of Seattle, whose production control system is described on pages 30-32.

### Air Control

Natural pure air is the best protection against dust, fumes and vapors, so the Bureau of Industrial Health for California reports (p. 35). For most industrial exposures, local exhaust ventilation is the most effective means of controlling the situation, but there is still a lot to be done in regard to welding for example.

### Arsenic in Bearings

When arsenic shows up in high-speed bearings, the alloy tends to become brittle, and remedies are suggested (p. 37) by several authorities to a manufacturer of bearing metal who asked help from the technical advisory service of SWPC's regional office in San Francisco. Two other problems dealt with by SWPC were distorting of storage battery grids and the staining of potatoes on metal screens in the dehydrating process.

### Plastics and Plywood

Dumbarton Oaks is not the only place where people can discuss collaboration. The Douglas fir plywood and plastics industries did the same thing at Seattle in July (p. 38-39), learning considerable about how these products can be used in conjunction. Many new developments coming up with both products.

### What Washington Wants

Some further light on the West Coast manpower situation is disclosed in the discussion by our Washington editor (p. 40) of the considerations involved—armed services want to smother the enemy by the weight and volume of our material, although they haven't gotten around to upping the pay rate in Navy yards to make the jobs attractive.

### Religion Helped Production

Chaplains in the armed forces are indispensable individuals, because in dire necessity man's thought reaches out for something beyond what human systems can provide. But does industry have a place for them? Industrial chaplains are so few and new that it would be difficult to generalize. However the Magma Copper Company at Superior, Arizona, found (p. 33) that its absenteeism rate dropped below any other mine in Arizona, as the result of the work of a combined industrial chaplain and morale officer, and that its production per man per day reached its highest point in several years. It wasn't a matter of sermons, but just diligent effort with individuals and small groups.

### Servicing Industrial Trucks

As industry gets deeper into the use of industrial trucks and cranes for materials handling, further systematizing of the operations become necessary. Where storage batteries are used as the motive power, a system for handling the recharging is desirable as the fleet grows in size. Benicia Arsenal has one of the largest industrial truck fleets on the Pacific Coast and has developed an efficient method (p. 36).

### Pace for Portland

Quiet, placid Portland it used to be in pre-war days, but the shipyards and their feeder industries put a new face on the city during the war period. Although it has seemed likely Portland would drop back to its old pace when the war ends, now there are indications (p. 52) that the area is just on the edge of many new industrial developments.

### In the Mail Box

Two letters this month giving views on postwar situation (p. 58), and two others disagreeing with *Western Industry's* editorial in the July issue favoring pushing out surpluses into the market promptly after the war instead of trying to work them off gradually.



# STANDARD ENGINEERS NOTEBOOK

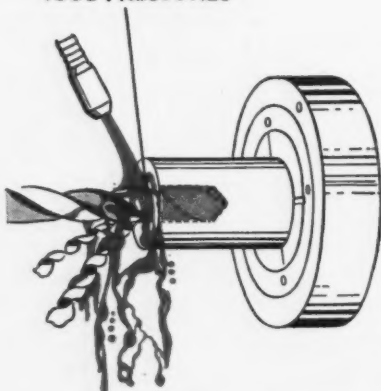
## Compounded concentrate for difficult metal cutting

Adequate lubrication and cooling for tools when they are used for very severe broaching, deep tapping, blind-hole tapping and other machining operations on iron and the toughest steels, are assured if Calol Cutting Concentrate EP is used.

Calol Cutting Concentrate EP contains a special added compound that gives it extreme pressure potency. It may be used straight, or diluted for less severe machining. Its viscosity at 100°F. is such that it will mix readily with diluents in the shop. Calol Mineral Cutting Oil 50P makes an excellent diluent for this product.

For the latest authentic information on the machining of metals, write for Standard's new free book, "Calol Cutting Fluids."

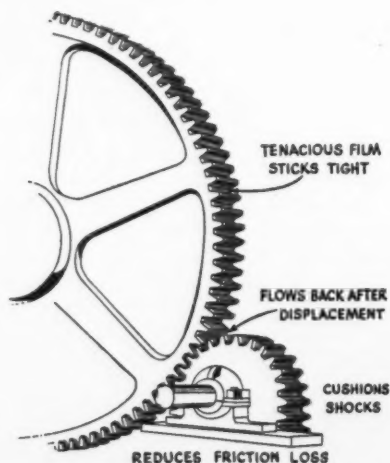
## WITHSTANDS SEVEREST TOOL PRESSURES



## READILY MIXES WITH DILUENTS AT SHOP TEMPERATURE

## Adhesive greases withstand heavy gear loads

Open gears may be thoroughly and successfully lubricated with Calol Pinion Greases.



Although Calol Pinion Greases have a very high viscosity, they remain fluid enough to return to gear teeth after the sliding action of the teeth has pushed them away. Their adhesive qualities keep a tenacious film on the teeth at all times. This tough film withstands pressures, cushions shocks and reduces frictional losses.

The lightest grade, Calol Pinion Grease 0, is also recommended for grease-lubricated inceased gears, particularly where climatic temperatures are low.

Calol Pinion Greases are made in four grades: 0, 1, 2, 5. The heavier grades are increasingly more adhesive and in some cases require heating for correct application.

Standard Fuel and Lubricant Engineers are always at your service. They'll gladly give you expert help—make your maintenance job easier. Call your Standard Representative or write Standard of California, 225 Bush St., San Francisco 20, California.

STANDARD OF CALIFORNIA

# POSTWAR PLEDGES NEEDED TO MAINTAIN WAR OUTPUT

***Slowing Down of West Coast Production Because Labor Feels  
Insecure Reveals Necessity of Taking Protective Measures***

**E**VEN while the flood-tide of war production sweeps on, tangible indications of the counter-current toward peace-time conditions in the West are beginning to appear.

War-time controls are keeping industry strictly on war output, but the lighter harness over labor has permitted a drift of manpower away from the area to the extent of affecting production of new ships and repair work somewhat.

Although the Army and Navy's slogan is "Let's finish the war first," evidence is

coming to light that more definite opportunities to prepare for peace must be granted by the government in order to keep the out-migration of labor from further affecting war production itself.

One piece of evidence is the plea of the Labor-Management Committee of the War Manpower Commission for Northern California, published in large advertisements in New York and Washington newspapers that West Coast employers be allowed (1) to reconvert a proportion of their war work to civilian production, (2) schedule

retooling and build up stockpiles against the future. All this to be done provided the surrendered portion of war work can be performed elsewhere and that specified critical labor occupations will not be used on this civilian production.

Need for positive incentive for labor to remain in the area, and to remove the feeling of insecurity for the future is the declared reason for this appeal.

Besides the figures (see statistical department, pg. 68-69) showing a steady decline each month in manufacturing employment

**\* Night scene of 100-octane gasoline plant of Standard Oil Company of California at El Segundo, showing thermo cracking units.**



# **RETAIL BUSINESS ALREADY COMING BACK** **Comparative Number of Retail Establishments in California** *(Reported by State Board of Equalization)*

	Jan. 1943	June 1943	June 1944	Net Difference Jan. 1943 & June '44
*Grocery .....	18,293	16,993	16,898	-1,395
*Meat .....	744	586	498	-246
Restaurants (no liquor) .....	17,363	15,900	16,239	-1,124
Restaurants (with liquor) .....	6,759	6,582	8,273	+1,514
Department Stores .....	3,761	3,603	3,705	-56
Clothing Stores .....	9,493	9,183	9,553	+60
Shoes .....	4,088	3,992	4,102	+14
Home Furnishings .....	9,251	8,722	9,357	+106
Radio .....	2,195	2,051	2,299	+104
Books-Magazines .....	1,639	1,595	1,681	+42
*Variety Stores .....	2,663	2,614	2,617	-46
Jewelry Stores .....	2,741	2,695	2,928	+187
Gifts-Novelties .....	2,555	2,390	2,689	+134
Motor Vehicles .....	4,632	4,429	4,694	+62
Service Stations .....	24,943	23,803	25,654	+711
Drug Stores .....	3,976	3,893	3,865	-111
Industrial Construction .....	5,669	5,633	6,299	+630
Lumber .....	6,775	6,338	6,191	-584
*Plumbing .....	2,792	2,602	2,560	-232
*Hardware .....	1,482	1,411	1,397	-85
Photo Supplies .....	1,744	1,665	2,035	+291
Fuel-Ice .....	1,567	1,502	1,593	+26
Unclassified .....	1,104	3,426	5,053	+3,949
Total .....	176,258	170,555	178,916	+2,658

\*Have not yet regained low level of January, 1943.

in the West—some of which of course is due to more efficient labor utilization and to WMC ceilings—tangible signs of the effect of the present situation are to be seen in the following:

(1) An unofficial analysis of Maritime Commission tonnage completed on the Pacific Coast in July shows a sharp drop, of which the equivalent of three average size ships is declared by an unofficial but competent analysis to be due to lack of manpower. The rest of the decline can be accounted for by change-overs from Liberty to Victory ships, which are slower to produce, and to completion of contracts by yards now going over to other types of war production.

(2) Ralph A. Bard, Undersecretary of the Navy, is quoted in Washington as saying in regard to manpower bottlenecks in West Coast shipyards: "With ship repair the No. 1 priority, the Navy is without authority to shift workers from non-vital to vital areas. Thousands of civilian employees have quit Mare Island, Hunters Point, Bremerton, for peacetime jobs. Congress has done nothing to help on important wage questions in Navy yards.

"There is a general thinness of manpower, but usually we are able to keep it under control. The West Coast shipyards are a different thing. There we just can't get ahead."

(3) Rear Admiral Frederick G. Crisp, director of shore establishments, said: "We have to fight Japan through our own West

Coast. There is no other way. Our facilities are there and our ships have to be serviced there. It's too late in the game to think of building installations where the labor surpluses happen to be just now. Geography and commitments have decided that, and we just somehow have to get enough people in these shipyards."

(4) The Washington Post, in a series of feature articles dealing with the war manpower situation, asserted that: (a) one cruiser with battle damage was kept out of fleet operations twice as long as necessary because too many men had left West Coast shipyards, mostly bound for peacetime jobs; (b) a score of ships waited in one repair port while workmen were scouted up to service them; (c) vessels that should have been put back in shape in six weeks frequently take eight, and others require 10 instead of eight.

(5) The shortage of tire makers has affected the Southern California area as well as Akron, Ohio, and Firestone were reported unable to use some of their newly installed synthetic tire making equipment for lack of labor. As it takes months to train tire makers, the Army's decision to furlough such men was essential, although news is lacking as to whether it has brought results yet. As a result of the shortage of heavy-duty truck tires in Los Angeles, it was reported that trailers for transporting ammunition were stalled.

The government finally has found, or perhaps rather summoned up courage to

use, a weapon to enforce rulings of the National War Labor Board against labor unions that have been using various devices to slow down production in order to win their demands. This was demonstrated when the Navy, undoubtedly under instructions from the White House, seized more than 100 machine shops in San Francisco and ordered cancellation of draft deferments and extra gasoline of workers who were defying WLB rulings.

This action rather surprised many observers, who thought that for political reasons the Navy would not be authorized to go so far, but it was taken and the unions began to back down immediately. The machine shop disturbance stemmed from a dispute over retroactive wages, in which the local unions used a ban against working overtime as a club against the employers.

F. W. Hunter, Pacific Coast regional director for WMC, says the Byrnes directive calling for tighter manpower controls should aid Pacific Coast war industries in getting the labor they need from surplus labor market areas throughout the country. Authorization for resumption of civilian production in surplus labor areas, he pointed out, will not be granted until the WMC representative certifies in writing that labor is available for such production without interference with local and inter-regional labor recruiting in the area. In other words, areas of labor surplus have an obligation to supply first of all needed labor for war industries.

## **Cutback Situation**

A review by the Production Executive Committee of WPB of 216 cutbacks between June 15 and August 1 showed that out of a total of \$215,827,000, only \$3,097,000 came from California, \$775,000 from Washington and \$433,000 from Nevada, as compared with \$37,031,000 from New York, \$32,850,000 from Ohio, \$22,946,000 from Massachusetts, \$22,102,000 from New Jersey, \$20,930,000 from Pennsylvania, \$18,207,000 from Michigan, \$12,173,000 from New Hampshire and \$11,523,000 from Connecticut. Only one large cutback was outside of a tight labor area. Louis M. Dreves, deputy WPB director for the Coast, reports cancellations of nearly \$197,000,000 in the last 60 days but also \$684,000,000 of new work.

Not much activity toward reconversion has been manifested yet. Because the Pacific Coast is a critical labor area, most firms do not see much possibility along that line, although there have been some inquiries already from firms who have had war contracts cancelled or cut back. The government's announcements about spot authorization for reconversion were made before specific instructions for procedure and the compliance forms were ready, so the coast offices of WPB have not been in a position to act. It has been suggested



that manufacturers would do well to file applications early, even though they are not ready to start reconversion, because of the length of time it may take to get clearances.

### Future Prospects

Data on intended changes in manufacturing employment in the three Pacific Coast states, submitted at the Murray Committee hearing on small business problems in San Francisco in July by Oliver P. Wheeler, director of Research of the Federal Reserve Bank of San Francisco, included the following:

After the war, as compared with 1943, the number of employees (excluding those in strictly government operations) will be reduced by 82 per cent in aircraft and 90 per cent in shipbuilding, but there will be an increase of 33 per cent in all other manufacturing, so that the overall shrinkage will be but 40 per cent. As compared with the pre-war average in 1939, the overall total will be an increase of about 44 per cent. In other words, there will be an approximate 250,000 increase over prewar, but a decline of 500,000 from the present level.

Between two-thirds and three-quarters of the men, and about half the women, apparently want to continue in industrial employment. It is plain that we will have an unemployed labor force of at least 300,000 at the end of the war, even under good business conditions, unless something is done to prevent it.

Preliminary tabulations, excluding shipyard and aircraft plants, and involving partial returns only, indicate that smaller firms intend to expand employment over wartime levels, while larger firms will either expand less or actually shrink. Figures are as follows:

Size of firm	Employment	Postwar employment intentions	
	Expans'n since 1939	Comp. with 1943	Comp. with 1939
100 or fewer	3%	+22%	+39%
100-500	44%	+2%	+47%
More than 500	34%	-7%	+24%

Very few Pacific Coast manufacturing firms (excluding shipyards and aircraft, not reported on as yet) expect difficulties in financing their changeover to peace-time production. Reporting firms employing a little more than 20 per cent of the total employed in all Pacific Coast manufacturing establishments, except shipbuilding and aircraft, look for change-over expenditures of only about \$33,000,000, of which they definitely intend to spend over \$25,000,000 or about 78 per cent as soon as the war ends and it is possible to get materials. Most of these funds will come from the firms' own resources and not more than 20 or 25 per cent will be borrowed.

A statement of the reasons given for anticipating difficulties in raising funds needed for postwar reconversion plans in various lines is as follows:

### Firms employing 100 or fewer

1. High federal taxes on small corporation make capital stock unattractive from a standpoint of dividends vs. risk (tire repair materials)
2. Cancellation of maritime contract depleted funds (brick)
3. Banks not enthusiastic about lending to small meat plants (meat packing)
4. Due to increased business, cash position is weak (textiles and textile products)
5. No financial connections (baskets and pottery)

### Firms employing 101-500

1. Anticipated delay and red tape in government contract termination settlement (electric switchboards)

2. Same (steel castings)
3. Banks relying too largely on guaranteed loans (aircraft tools)
4. Capital expenditures not provided for in present financing arrangements (oil well equipment)
5. Banks reluctant to supply funds (heat exchangers)
6. Anticipate heavy demand for loans during reconversion period (steel fabrication)
7. General uncertainty (electric machinery)

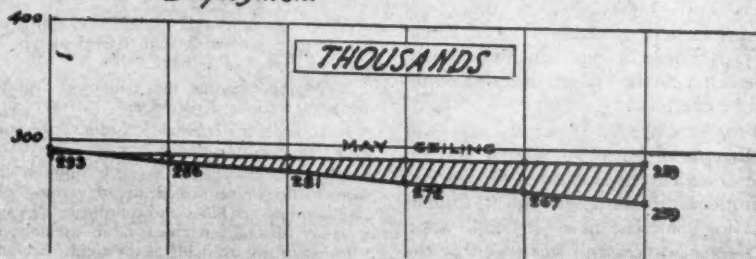
### Firms employing over 500

1. Termination and renegotiation difficulties anticipated (door lockset)
2. Dependent on prompt settlement of government contracts (oil seals)
3. Uncertain as to method of financing that will be used (steel castings)

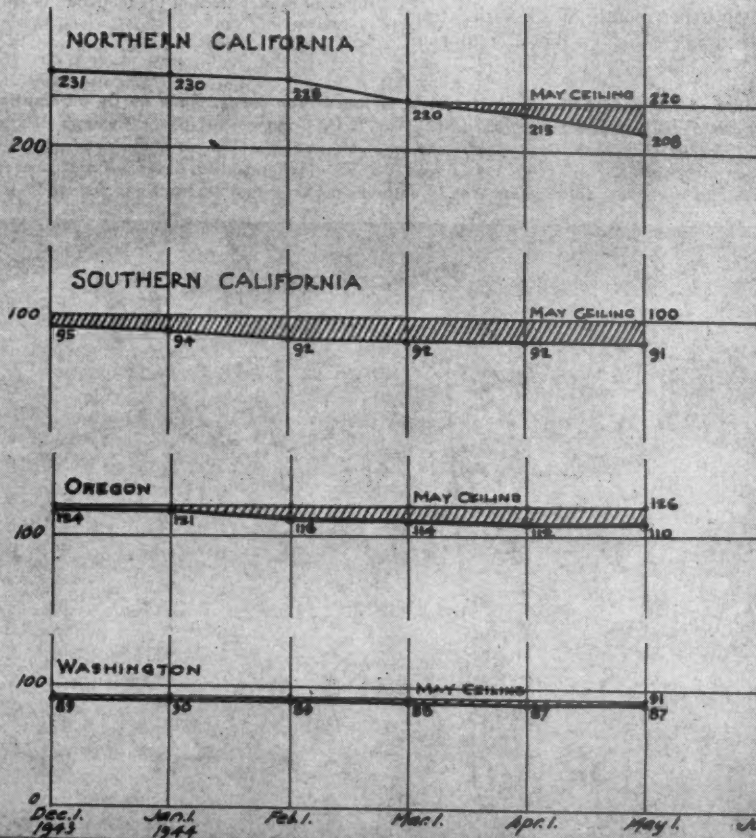
## MAJOR WEST COAST AIRCRAFT FIRMS

### Legend:-

- May 1944 Ceiling
- Employment



## MAJOR WEST COAST SHIPBUILDING FIRMS



# Western Gear's Application Of Production Control System

THE same problem that has faced many small industrial plants—that of developing a production control system that really works, has been successfully solved by Western Gear Works of Seattle, Washington.

From 1907 until Pearl Harbor, this plant had not found a rigid system of production control necessary. With employees fewer in number and long in experience, the business was of such a nature that department heads and executives could keep the various jobs "in their heads" and production moving smoothly.

Pearl Harbor changed that. Almost overnight, orders by the hundreds began to pour in, priorities became more and more entangling, materials became scarce, job orders on the books piled up. It was not unusual to have as many as 500 different contracts active at one time. Obviously, some better method of production control must be effected.

What was needed required study—for of all types of business, there is perhaps none where a greater variety of work would be in process than in a gear plant. Dozens of major contracts, new "custom" work, replacement orders and small jobs by the hundreds, with delivery schedules from eight hours to two years, had to be kept moving through the shop on schedule. Quantities varied from a single piece to thousands per month. Work varied from small gears 1/2-inch in diameter to giant

gears 12 and 14 feet in diameter, from aircraft actuating units small enough to hold in the palm of the hand to giant crane machinery.

Besides, there was the big problem of controlling the great amount of sub-contracting work which was necessary to meet schedules. Such a conglomeration of jobs required a system simple enough for new and routine workers to quickly grasp, flexible enough to cover the multitude of jobs, changing schedules, and sufficiently inclusive to cover all exigencies.

First step in developing a workable production control system was isolating Western Gear's major production problems. Boiled down to major premises, they became six:

1. To determine the company's ability to handle proposed work, with regard to type of work and speed of delivery.
2. To predetermine the manpower requirements for various departments.
3. To order material and coordinate receipts with shop requirements.
4. In the movement of work through the shop, to determine precedence of various jobs on individual machines and coordinate all parts necessary for one assembly, or sub-assembly, so as to have them available at the right place and at the right time.
5. To coordinate sub-contracting with shop load and facilities, and
6. To maintain production records that were sufficient to keep track of the thousands of parts in process of manufacture, yet which avoided "red tape."

With these as a goal, Western Gear's answer to the maze of war-time confusion, the "Production Planning and Control" department, was established.

To keep the whole system in its lowest common denominator, responsibility for coordination of all phases of Western Gear's production is centralized in this department. Here production is planned, material requisitioned and expedited, schedules and routing of individual pieces is determined, and the actual day's work of each machine operator is lined up.

These functions are handled by a number of sub-groups within the department. Planners work out the scheduling and routing, and coordinate tooling requirements. The material group makes up material requisitions, coordinates pattern work and is responsible for having material on hand in time to start production. Shop dispatchers handle the movement of material through the shop, and determine the order of work in each machine according to schedules established by the planners. The sub-contracting group makes all arrangements for work to be done outside the plant, occasioned when an overload in certain departments makes sub-contracting necessary.

Each of the above groups takes care of its function on all jobs. In addition, and working closely with the Production Control Department, are Project Engineers, assigned to be responsible for major contracts. Each of these men is assigned to a

• Heart of the production control system is these four cards, made up by automatic duplicator: (1) The Production Control Copy provides a central progress record; (2) The M.O. Copy routes parts through the shop, furnishes instructions to operators and material men; (3) M.O. Cost Copy sets up cost record which parallels production, has ledger form on reverse side for use with accounting machine, and (4) Expediter's Copy, which provides information for project men. Cards are duplicates except for their color, and give key department heads uniform records and instructions for each job.

The image shows four overlapping production control cards. The top card is titled 'Gibbs & Cox' and 'Low Speed Gear'. It contains fields for 'Job No.', 'Part Title', 'Quantity', 'Start Date', and 'End Date'. Below these are several rows of data, including 'Mater. with 15T. Pt. #173, Drg. #C2559-1' and 'Ctrs. 18.750'. The card also has a section for 'OPERATION' with a list of tasks: 'Turn, Face, Bore', 'Cut', 'Keysat', 'Inspection', 'Burr Teeth', 'Clean, Paint', and 'Project Stores'. The bottom card is titled 'M.O. Cost Copy' and contains a ledger form with columns for 'Job No.', 'Part Title', 'Quantity', 'Unit Cost', and 'Total Cost'. The cards are color-coded and contain various fields for tracking production progress and costs.

single contract, or series of contracts, and is responsible for coordination of all work on his orders. He acts as a trouble-shooter and clearing house for information concerning his particular jobs.

An order, coming into Western Gear's order desk, goes through a systematized procedure. As soon as the order has been entered on the books, it is assigned a job number, and a job order is forwarded to the Production Control Department. Once there, the first step is to establish an overall plan for production and to verify delivery requirements. This is done by the planners. Since the job may require further design or detailing, it is sent to the Engineering Department. Engineering completes the design and furnishes the planning group with a complete set of approved drawings.

Having studied the requirements of the job, the planners make up a set of Manufacturing Order, or M.O., Cards. The complete set of cards is printed from one typewritten original by an inexpensive duplicating process (see the two illustrations). One complete set, including four full-size copies and a set of smaller cards, each of the latter carrying the heading and one operation only, is made for each part to be manufactured. These give routing, operations required, date at which each operation is due to be finished, estimated time, and general information concerning the piece.

One of the large cards is kept in the Production Control Department's files, and is kept up to date to show the current status of each manufacturing order in the shop.

The second large card is issued as a routing sheet for the shop and travels with the material.

The third large card is sent to the Cost Department and is used as a ledger sheet to record the costs of material and labor accumulated against the manufacturing order, while the fourth card, the Expediter's Copy, is used by the project man for information.

The small "operation" or "load" cards are sent to the department in which the operation they list will be performed, and where they are used in lining up work for individual machines. Each load card is forwarded to the production control file when the operation listed upon it has been completed. By this means the production control file is kept up to date.

While the planners are setting up the manufacturing schedule, the material group is making up requisitions for all the material required, working with the planning group to determine delivery requirements. When enough material has been received to make up one lot of a particular part, a manufacturing order is automatically released to the shop, along with a copy of the detail drawing in a transparent folder. A Material Control Card (not illustrated) to record receipt of purchased material is



• This central production control file records progress of all parts in production. Kept up to date daily by noting load cards received, indicating the completed operations.

run off simultaneously with the M.O. and load cards.

In each of Western Gear's three main shop sections is a central dispatching station. Each machine in the section is represented by a space in a machine loading rack inside that station. In the rack for each machine are all the "load" cards of work actually ready to be worked at the machine. These load cards are arranged in the order in which they are to be worked—

normally in order of the "due dates" established by the planners when the job first comes into the plant.

As the machine operator finishes a job, he brings the folder containing the large routing card and the drawing back to the dispatch station and receives the folder for the next job in the rack. A timekeeper at the station makes out a time slip for the job completed, forwards the "load" card to the planning office, and turns the fin-

• Individual "Load Card" is run off by automatic duplicator for each operation listed on the larger M.O. cards shown in illustration A. Note that the heading remains same on all cards, eliminating any possibility of confusion. Load cards schedule work into machines, are then returned to central files to indicate completion of the operation.

LOAD AND TIME CARD									
Gibbs & Cox									
Low Speed Gear									
Start 5/15/44									
Sour 60 2/2 20°									
Mates with 15T. Pt. #179, Drg. #C2523-1									
Ctrs. 18.750"									
20.000" 2"									
2.875" 2.876" 20.800"									
1 50 Turn, face, bore									
2 22 Cut									
3 45 Keyseat									
4 18 Inspection									
5 18 Burr Teeth									
6 18 Clean, Paint									





• One of the timekeeping and dispatching stations, where work is scheduled for individual machines. Girl turret lathe operator, who has completed her operation, is shown returning card. She will receive M.O. card and drawing for next job from timekeeper.

ished routing card folder over to a mover after checking off the operation as completed.

The mover transports the material to the next work center and turns the folder in to that section's dispatch station. The dispatcher at that station puts the corresponding "load" card in the machine rack according to the date at which the new operation is due to be finished, and the entire cycle is repeated.

When the last operation has been finished, the material is inspected and then delivered to the storeroom indicated on the routing card. The routing card is then signed and returned to the control file. This entire procedure keeps all the parts moving automatically in accordance with the original schedule. If a job falls behind, it automatically receives precedence because of its earlier due date until it is again on schedule.

In the finished parts storeroom, a location is assigned to each major assembly job, and as parts are finished they are routed to this area. When all the material is on hand for an assembly, it is issued to the assembly department as a unit. The storeroom's record is kept on an "Assembly Parts List" made up by the planners for all jobs requiring assembly. Parts that do not require assembly are routed directly to the shipping department.

If the backlog in the loading rack indicates that any machine or group of machines may become overloaded, the dispatcher takes the problem up with the subcontracting group, and steps are taken to "farm out" enough of the work to prevent a bottleneck from developing. If it

is obvious at the time a particular part of a job is scheduled that it will overtax facilities, those operations involving the overloaded department are routed as "outside operations" and arrangements are made immediately to sub-contract them.

Each morning a short production meeting is held in Western Gear's conference room, attended by the production supervisor, chief dispatcher, and project engineers. Here, critical items are discussed and information concerning any new developments is exchanged. From the time estimates on the M.O. cards, a chart of the number of machine hours of work on hand for each group of machines is maintained. Time is added as new orders are made up, and removed when the "load" cards are received from the shop, indicating that the work is complete. With these charts, the department has at its fingertips accurate and up-to-date information on the available capacity for each type of equipment and a double checking system to warn of approaching bottlenecks.

Not only has their Production Control system been a satisfactory and efficient answer to the major problems confronting Western Gear's management at the beginning of the war, but it has proved beneficial in other ways. Although the system involved the training of a number of people at the outset, it also developed that with the system working smoothly, it became much easier to train new men, and less supervision was required. Routing cards for each job answered "whys" and "wherefores," gave employees an understanding of what was going on and a feeling of being a part of an important job.

The system as outlined here allows variation in detail without departing from the basic plan. It could be installed, with necessary changes, in other types of industrial plants.

Western Gear's officials make no claim that their plan is the only one that can work. The fact that it does really work, and well, is justification for passing on their experiences in the interests of war production, all the while realizing that each manufacturing plant has its own special problems of production control. Any production problem, they declare, can be overcome by "perseverance, common sense and the realization that a production control system is a means to an end, and not an accomplishment in itself." The system is rewarded. The plan has created desire to better previous performance. It has made the lowest level of supervision management conscious. It has encouraged initiative resulting in better effort and larger dividends for better supervision.

### Lockheed Has New Awards Plan

Lockheed has a newly created Patent Remuneration Plan or Special Awards Plan. Under the first, employees are given a fixed share in all profits the company enjoys as a result of licensing the invention to other concerns and 11 employees already have shared in \$22,000.

Ninety-two checks for approximately \$27,000 in special awards were delivered to employees and former employees for extra-merit proposals for improvement. These were additional rewards for improvements considered to be deserving of greater recognition than is provided by the regular Lockheed Employee Proposal for Improvement Plan, or awards to supervisory personnel not eligible under the regular plan. Supervisors are eligible to receive consideration for award for proposals on the work they supervise when such a proposal has saved \$15,000 a year or more.

Under the Special Awards Plan, proposals submitted by any employee are considered if patented or copyrighted by the company and which have earned in excess of \$50,000 a year.

Top extra-merit award of \$3,000 went to Mason L. Arnold of Lockheed Factory A-2 for his suggestion which simplifies cowl fabrication for a new land based bomber now being built by Lockheed.

### Parking Meters Included?

"Airparks" and "Flightstops" are what the well-dressed communities of the future will wear, according to Joseph T. Geuting, Jr., chairman of the Personal Aircraft Council of the Aeronautical Chamber of Commerce. An Airpark is a community center of fixed size, costing from \$10,000 up, while the other is a runway built adjacent to a highway, a cost of from \$6,000 to \$10,000 and requiring no permanently assigned personnel.



# Building Morale in An Arizona Mine...

**Starts With An Education in Americanism and Overcoming Resentment Against Discrimination**

**B**UILDING morale in industry is also a matter of education in Americanism, with entirely different methods used in various areas, according to the type of people. While there are certain set rules common to all, the bulk of morale building rests on a definitely worked out system, worked out with the traditional background of the employee in mind.

At one company, where the greater percentage of the miners are of Mexican descent, one cannot use the same methods required at a copper company only 20 miles away where a majority are of Indian descent. Slavs, Assyrians, Scandinavians and native-born Americans present another problem. Each of the problems involved has a distinct bearing on morale.

In the mining industry in certain localities, the matter of race discrimination is shown to a marked degree, especially where the percentage of foreign born is larger than the native Americans. It does not proceed from industry, but from the community at large, and makes it difficult to build up pride in country, achievement and production records. Even when an employee has the determination to be a good American, it gives him a decided "don't care" attitude.

## Discrimination Resented

Here in such a community, dances are held where no one but white Americans may attend. Yet in the high school all races are allowed to attend. In the grammar school there is again a distinction, as there is both a school for the Mexicans and a school for the Americans or whites.

The foreign-born Americans resent greatly this discrimination, and such discrimination affects greatly the work in the mine, the mill and the smelter and brings up a tremendous problem for the morale director. This is extremely difficult to solve, for underneath, in the attitude of the employee, there is always this resentment over such discrimination and it greatly affects his production capacity and his laying off.

## "Hot" and "Cool" Mines

Then in the mining industry we have what are known as "hot" and "cool" mines. The problem of morale in each one seems to be quite different. In the former, vitality of the men is more easily sapped. They have that all-gone feeling and feel that it is due to the heat, so the desire to just lay off and take a rest is quite prevalent. Such is not the case in the so-called "cool" mines. And the problem of the morale officer in the "hot" mines is one of

By REV. WILLIAM J. HAZEL, D.D.  
Industrial Chaplain and Morale Officer,  
Magma Copper Company, Superior, Ariz.

considerable moment, especially when wages are so high.

Couple these above matters with an area where the recreational facilities and the amusement facilities are extremely low. The evening entertainment is limited—greatly limited—and the miner's life runs in a groove. Then it is that the liquor problem comes up in a tremendous way, particularly because he is prohibited from buying things where his money formerly went.

## Resist Labor Freeze

Finally there is the attitude of mind that seems to have grown up in the workman because of the freezing of labor. Because it curtailed their freedom, men who had seldom, if ever, laid off a day began laying off quite often just to show the government they could do it.

Solving of such problems, partially, so that our war effort might be increased, was even a greater problem. However, we went at them as best we could: first the race discrimination problem wherein we were dealing with Mexicans, Finns, Serbians, Montenegrins, Czechs, naturalized Americans and native-born Americans, and the native-born white Americans were much in the minority.

In starting it was the task of the morale officer to prove conclusively that he had no part in this race discrimination, and mere words in this proving were useless. It had to be done by actions and attitudes and there were plenty of places where the morale officer had to make a definite stand.

He also had to make them see that from the standpoint of social equality he did not discriminate against a race but against types of individuals, foreign or American, who were vile, drunks, roughs, and evil. Gradually the men came to see that it was not race discrimination but individual discrimination, against indecency, drunkenness, evil and for decency, soberness, good citizenship, regardless of who the person was, or what race he came from.

This was done through daily and constant friendliness, and once the men were convinced of the attitude of the morale officer, the problem, while not by any means solved, was tremendously helped. Then, and then only, could the morale officer do any stressing whatever of patriotism.

*Is a morale officer a good investment?*

*Is an industrial chaplain a practical individual?*

*In a labor force coming from many lands, Magma Copper Company's rate of absenteeism is the lowest in years, about 4 per cent lower than any other mine in Arizona, while production is the best in several years.*

In all the work I tried to be a friend of the men. I made them see that I was here to help them and that although I was employed by the Magma Copper Company, my chief interest was in men. While the men knew that it was my job to do my best to keep men on the job, they also began to realize that there was a real personal interest as well, that I was interested in them personally, in their families, in the son overseas, in the daughter at high school and in their home and community problems.

By this method the men soon began coming to me for all sorts of advice, with all sorts of tales, with personal matters, wife problems, asking favors, to help them get relatives into the states from Mexico; and innumerable other matters. However, remember that this did not come at once. It took considerable time to win these people.

## Developing Recreation

The second tremendous problem here was the limited recreational and amusement facilities. During the winter, through the Magma Club, dances were held practically every week. Often the old fashioned square dance was held and these were always crowded. Through the directors of the one small bowling alley in town, help was given in the formation of bowling leagues which were of vital interest to a certain few.

Then in the summer months a twilight baseball league was organized that played three week day or week evening games and usually a game was played with an outside team on Sunday.

During the bond drive we held a baseball series between the league teams and all the money taken in was used to buy bonds and each one who attended the games had a chance to win a bond at each game. In fact, there were some 20 bonds won in this way. All these may seem small and insignificant, but each added to the other was a factor in the morale of the men and also of the women.

## Combating Liquor

The real problem of any mining community seems to be liquor. Several meetings were held with the liquor dealers and the problem talked over frankly with them.

Theirs was a business and by reiterating that fact to them we secured a considerable



**MORALE IN THE MINES** (From Pg. 33)

degree of cooperation in the matter of closing the saloons on Sundays and at an early hour in the evenings. These liquor dealers also made it difficult for men who were constantly off from work unexcused to purchase liquor.

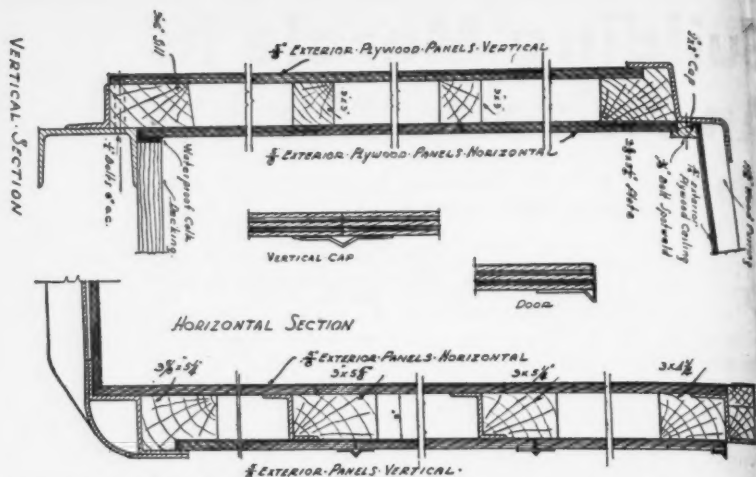
Coupled with this I contacted the head of the Brewing Foundation in the state of Arizona, and through him the problem of certain greedy liquor dealers who constantly sold to drunk or mostly drunk men was pretty much solved. Then this brewing head came to Superior and held several meetings with the saloon men and insisted on their cooperation with the war effort as far as was possible.

Couple all these things with continual personal talks, any place the men happened to see me, and in the early months of the work a trip at noon down into the mine where the morale officer talked to the men on different levels at the noon hour, and it all adds up to morale.

Early in the work the morale officer published a small news sheet concerning production and the war effort but mostly items that were of interest to the men. Copies were sent all over the world to the sons of the miners fighting in the far flung battle fronts. And in this small news sheet the trend was not so much the company but the interests of the men.

The morale officer found he could do considerable regarding the freeing of labor and absenteeism by quietly talking to the men and agreeing with them as he did and then leading from agreeing on to the great need of our boys over there, the war effort, the ruthlessness of the Japs and Germans, the type of country we live in as compared with theirs etc.

In it all we were trying to build for democracy as well as for war production. By such seemingly simple methods the absenteeism here at the Magma Copper Company, Superior, Arizona, is the lowest it has been in years and about 4 per cent lower than any mine in Arizona, while production per man per day at this date is the best it has been in several years.



\* Cross-section detail (above) of the Great Northern's new cars and the construction scene (left) show how plywood sheets are used for sheathings, doors and ceilings.

## Plywood Box Cars Arrive

**G**REAT Northern Railway has gone in for 50-ton freight cars made of Pacific Northwest plywood combined with steel. Outside and inside sheathings are of plywood  $\frac{5}{8}$ -inch thick, and the combination of materials results in a freight car which is two tons lighter than the average standard box car.

On the outside, panels of Douglas fir plywood are Exterior-type, made with permanently waterproof binder,  $\frac{5}{8}$ -inch thick and are placed vertically. The sheets are 4 x 10 feet in size and extend in one piece from bottom of car to top. The vertical joints between panels are covered by thin metal strips and bolted through to lumber studding. At horizontal points panels are riveted through to lumber stiffeners.

Plywood and steel also combine to form the doors, two panels being fastened together with a glued spline at the joint to form one large panel that is slipped into the metal frame.

Cargoes will be protected from dirt and cinders since the cars are lined also with the large panels. On walls, panels are  $\frac{5}{8}$ -inch thick while on the ceiling thinner  $\frac{5}{16}$ -inch panels are used.

On interior side-walls panels are installed horizontally in contrast to the exterior sheathing which is vertically placed.

### Promoting Uniformity In Vendors' Catalogs

What a designer requires in a vendor's catalog has been worked out by the National Aircraft Standards Committee to avoid irregularities and omissions which frequently result in holding up negotiations while the vendor's representative wires his factory. G. M. Aron, standards engineer

for Northrop Aircraft, Inc., representing the committee has announced the findings, which are enumerated by E. A. Pinger, standards engineer, Consolidated Vultee, as follows:

#### NECESSARY CATALOG REQUIREMENTS

1. Parts should be identified by name and number.
2. Catalogs should carry the date of release. In the case of looseleaf catalogs, the date of the latest page revision should appear on each page.
3. Sufficient information to allow practical application of the part should be shown, such as envelope size, tolerances, location and size of electric, hydraulic, pneumatic, or other connections, etc.
4. Changed parts should be given new numbers or dash numbers unless dimensionally and functionally interchangeable.
5. Maximum strength or capacity of parts should be specified.
6. Type and specification number of the material from which the part is fabricated should be shown. Government drawing or specification numbers to which the part may be manufactured should also be noted when applicable.
7. Method of interpreting coded part numbers should be specified.
8. All pages should be numbered.
9. Parts having general government approval for use on aircraft should be noted.
10. Catalogs should be carefully indexed.
11. Special information necessary for proper installation of the parts should be specified.
12. Information regarding the proper method of ordering should be included when necessary.
13. The accurate actual weight of all parts should be shown. If at any time the calculated weight is used in lieu of the actual weight, it should be so specified.

#### DESIRABLE CATALOG REQUIREMENTS

1. Catalogs should have an identifying number.
2. Special tools necessary to install parts should be listed.
3. Related drawings giving more detailed information should be referenced when available.
4. Catalogs should be approximately  $8\frac{1}{2}$  x 11 inches in size to facilitate filing.



• Lead analysis work in progress at the California Department of Public Health industrial laboratory at Berkeley

## AIR CONTROL—Over Fumes, Gases, Vapors

**I**N control of the hazardous materials—dusts, fumes, gases and vapors—which are the causes of occupational diseases, we must be practical. The more nearly natural conditions we can maintain the more effective will be the control. Substitution of a less toxic for a toxic material is the first control to be attempted.

If the concentration can be reduced to safe levels by general air dilution that should be done. The most commonly used and many times most practical means of control is local exhaust ventilation and in most industrial exposures this is the most natural and effective means of control.

In paint spraying operations, there is no great handicap to the worker in working in a well designed spray booth. It protects him from serious exposure and actually makes the work more pleasant providing the workman utilizes it intelligently. Naturally if he stands down stream the spray booth might even be worse than no control at all, because all of the mist and vapors will be forced into his breathing zone by the flow of air.

The respirator is a useful and sometimes very valuable means of control. But it is artificial and in most cases the workmen do not like to wear them. In general, they should not be used unless there is no other better control available.

Local exhaust as a booth, grilled top

By **HAROLD T. CASTBERG**  
Chief, Bureau of Industrial Health  
California State Department of Public Health\*

table or hood affords much more comfortable and actually more effective control than a respirator. There are of course instances where only a respirator could be used and we cannot dispense with them. Whatever the control method used, we must take human nature into account because it is humans who are going to employ these methods.

In the matter of welding, the accepted method of control at present is the local exhaust duct which will completely take the smoke and fumes away so that the workman gets no exposure. If this is properly used, there is no doubt that it is effective.

What does proper use mean? It means that the end of the duct must be kept within 6-9 inches of the welding at all times. The duct will then pick up all the smoke and fumes produced. In a fixed location this is simple and it is the answer. But on a ship, for example, where it is difficult to carry the heavy equipment necessary with this type of control it just is not used properly.

For some time now, attempts have been made to find a more adequate control de-

vice. Inasmuch as the welder must use a face shield anyway, ventilated shields have been devised. There is usually a standard shield in which a tube has been fitted which forces fresh air over the breathing zone of the welder under the hood. As long as the hood is down, some protection is afforded with certain designs. In others, the exposure is worse because the jets of air cause the introduction of the injection principle and the toxic fumes are picked up at the edge of the shield and are forced past the welder's breathing zone.

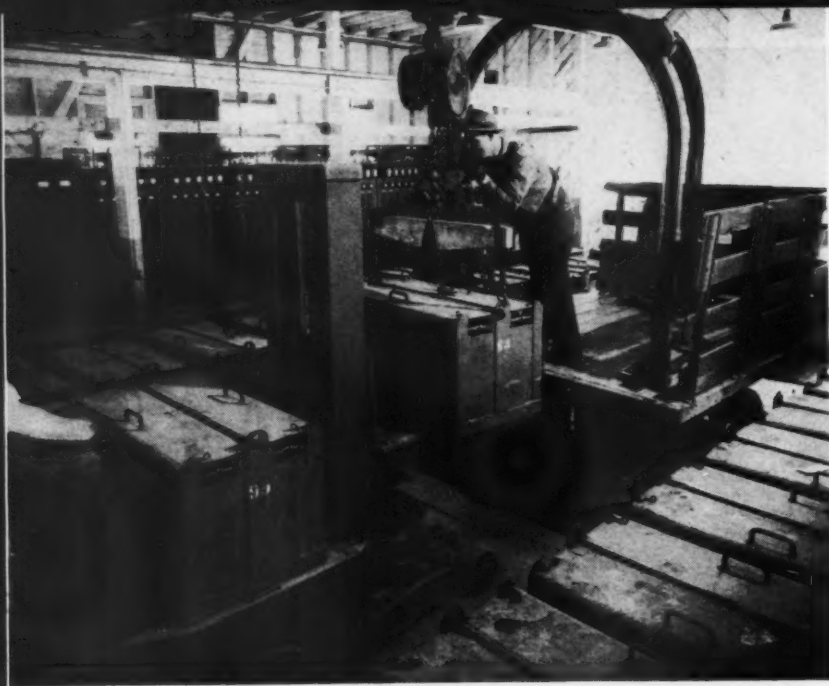
In any case, these devices are not satisfactory and do not do the job because as soon as the actual welding ceases, the welder raises the shield, thus affording him no protection. The fumes are still there. Very likely this principle can be perfected to be made satisfactory but it isn't now.

One thing that has been frequently overlooked in establishing safe working conditions from exposure to harmful dusts, fumes, gases, and vapors is the benefit which can be derived from concurrent medical observation. Frequently we will find conditions very unsatisfactory in a particular operation and make recommendations for correction by engineering means. What about the workman who has been working in those unsatisfactory con-

(Concluded on Page 37)

\* From address at California Safety Assembly, April 1944.





• Rig mounted on small motor truck for transferring the 1800-pound storage batteries brought in for recharging. Westinghouse charging control switchgear in the background.

## Battery Recharging on Assembly Line Basis

ONE of the largest industrial truck fleets on the entire Pacific Coast is that of the Benicia Arsenal, and to keep its 80 battery operated trucks, fork trucks, and cranes in uninterrupted service a battery recharging operation has been provided that assumes assembly line character. Batteries are brought into the recharging room on a special truck equipped with a hoist and the generator output is under automatic control to provide adequate charging capacity and protect against overloads.

The arsenal, located on Suisun Bay which is the confluence of the Sacramento and San Joaquin Rivers with San Francisco Bay, is one of the oldest military bases in the United States. Its functions include storage of ammunition and other war materiel and repair tanks and other battle damaged war equipment. It is served by rail, truck, and water facilities.

To assure peak operating efficiency, all batteries are recharged on a rotating schedule at the end of each 8-hour shift. During the operating period, the trucks travel about 30 miles in addition to the lifting and stacking work. The trucks travel at a speed of about five miles an hour and their loads range from 3,000 to 7,000 pounds. Batteries weigh over 1800 pounds each and are mostly of about 15 KWH capacity.

In order to supply sufficient current to

recharge the batteries, three synchronous motor-generator sets, rated at 75 kilowatts each have been installed. The principal feature is that the control is fully automatic and so arranged that additional machines are connected to the bus as required by the load and these are automatically disconnected as the load becomes lighter and the last machine shut down when the last battery is fully charged. Control of this power is handled through cubicle switchgear, designed to include three motor control, and three generator control and nine charging control units. The incoming 2300-volt line is fed through a primary cubicle equipped with a de-ion oil circuit breaker. Five outgoing circuits on each charging control panel permit simultaneous recharging of 35 to 45 of the big storage batteries.

Because of the size of the installation, reported to be one of the largest of its type in battery charging operations in the West, it was desirable to provide automatic control of the generator output to provide adequate charging capacity and to protect against overloads. The paralleling apparatus helps increase efficiency of the equipment and minimizes maintenance.

It functions when the load on any one of the charging generators reaches maximum rated capacity of 75 kilowatts. The

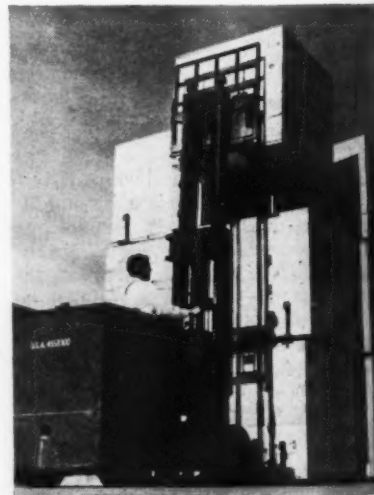
paralleling apparatus then cuts in the number two and three motor-generator set as required, providing a maximum recharging capacity of 225 kilowatts. As each battery reaches a state of full charge it is automatically disconnected to prevent overcharging. As the load drops to within the capacity of two generators, number three machine is shut down, then number two, until the entire set is shut down upon the last battery reaching full charge and cutting off.

Included in the battery recharging department is a plant for distilling water, having a capacity of 15 to 20 gallons daily, which also supplies all the other distilled water needs of the arsenal, such as jeeps, automobiles and motor trucks.

Although the original of the arsenal dates back to the days of General U. S. Grant and earlier, the officials in charge have kept up to the minute in their materials handling operations. They use the "locator" system for keeping track of items in storage and have increased their yard capacity by employing cranes to supplement the fork trucks. Fulllest possible use is made of the palletizing.

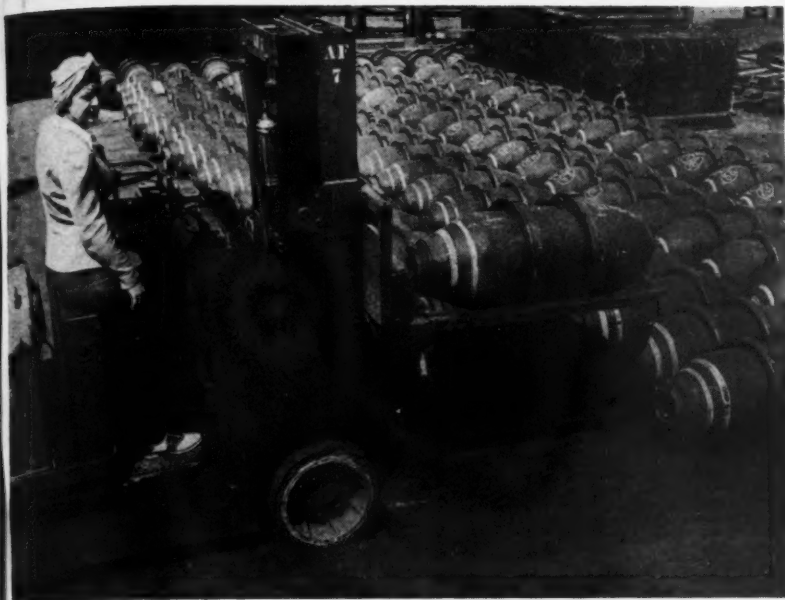
The locator system was devised by General Motors and is generally in use at arsenals throughout the country, although it is understood that many large businesses are still unaware of its invaluable service keeping an absolute check on inventory. Under this system, all storage areas, inside or outdoors, are divided into sections keyed by number and letter, assigned by the chief locator and each item listed on the inventory according to section, tier, etc. Consequently, there is no danger of items going "dead" until inventory time.

Cranes handle boxes, crates, and other packages too heavy or high for the lift trucks or which will not balance on the forks, and in the tank repair department self-equalizing slings, are used for dropping turrets into place or slipping guns into their slides.



• Lifting a crated 3-ton tank motor 12 ft.





• Handling 1,000-pound bombs at Benicia Arsenal with flexible fork-lift trucks

## Arsenic Action on High-Speed Bearings

**W**HETHER the presence of 0.35 per cent arsenic is considered detrimental to high-speed bearing performance, is a question recently asked the technical advisory service of Smaller War Plant Corporation's regional office at San Francisco. The inquirer, who also wanted to know the objectionable properties of arsenic and its minimum allowable percentage, manufactures a tin base babbitt bearing metal with the following approximate analysis:

Tin .....	87	to 89	%
Antimony .....	7	to 8	%
Copper .....	3½	to 4½	%
Arsenic .....	0.2	to 0.35	%

Information from several authorities generally agreed that arsenic makes the alloy brittle. B. J. Esarey of National Bearing Metals Corp., said that in his opinion the allowable arsenic limit should be 0.1 per cent and that even small amounts down to that point conferred brittleness on the alloy. He said small amounts of arsenic increase the room temperature hardness without helping retention of the normal hardness of the alloy at higher or running temperature, thus resulting in a lack of embeddability, which is an important asset during the running in time of high speed bearings. He recommended reducing the arsenic content by refining.

The 1939 Metals Handbook said, "In general, arsenic up to 0.4 per cent has the reputation of increasing the hardness and yield strength of babbitt. In lead-antimony

bearing metals it is said to cause grain refinement and also to cause difficulty in bonding to bronze backing metal. Arsenic is said to cause the formation of coarse crystals in tin-base bearing metals."

C. H. Binbaum of the Lumen Bearing Company, said, "Arsenic in babbitt has a tendency of embrittling the alloy and it is simply a question of how brittle an alloy can be made." R. D. Zonge, Lycoming Division—The Aviation Corporation, said, "All the literature infers that arsenic is a detrimental impurity, its effect being the lessening of the ability of the bearing to deform under loads."

G. J. Huebner of Chrysler Corporation said the increase in strength and hardness produced by addition of arsenic will be accompanied by decrease in elongation and increase in brittleness, and that these effects have begun to be evident by the time the arsenic content gets as high as 0.10 per cent. With .35 per cent arsenic, premature cracking of the babbitt might be expected in any application where considerable deflections of the babbitt occur repeatedly or where the bearing operates under heavy enough load to deform the babbitt permanently.

According to E. R. Darby of Federal-Mogul Corporation, the most important effect of arsenic from the standpoint of manufactured bearings is to render the bonding of the alloy to bronze backs extremely difficult. From the experience of

Federal-Mogul, any amount in excess of .20 per cent will give trouble in this respect.

### Aging Storage Battery Grids

Another Pacific Coast manufacturer referred to SWPC difficulty encountered because the pressure for quick delivery makes it necessary to use storage battery grids shortly after they are cast, instead of letting them stand for several weeks to harden. Consequently, the soft grids often distort when going through the pasting machines, resulting in a great deal of scrap. Increasing the antimony content from 7 per cent to 9 per cent appeared to help somewhat but did not solve the problem.

J. A. Orsino of National Lead Company reported that in some instances it has been necessary to use as high as 12 per cent antimony grid alloy, although an average of 9 per cent is usually adequate to produce grids after aging. He knew of no commercially practical method for hardening grids in less than three days. L. E. Wells of Willard Storage Battery Company advised the use of 12 per cent antimony as the quickest means of providing grids which will require the minimum aging period. E. L. Seabury of Delco-Remy Division of General Motors advised quenching the grids in cold water and taking immediately from the hot grid molding dies.

Another problem recently handled was that of a potato dehydrating firm who had found that metal screens stained the potatoes. Use of a phenolic resin, brushed or dipped on followed by baking for a few hours, was recommended. This made a heavy but flexible coating which withstands both corrosive action and heat.

The San Francisco regional office of SWPC has built up a library of reference bulletins covering 58 subjects in research, production, marketing and management problems which may be obtained on application. These cover not only problems worked on in this region but also everywhere else in the country by SWPC.

### AIR CONTROL (Cont'd from Page 35)

ditions? What has happened to him already?

Such operations will give us clues perhaps to the final establishment of more adequate safe limits for these exposures inasmuch as many of them are only in a tentative stage.

It is not always enough to have only engineering control. Medical control must accompany it. For example, in lead exposures, it is necessary to maintain medical control by periodic physical check-ups in order to see whether or not the engineering control is working effectively. Thus, in plants with high lead exposure, periodic stipple cell counts are made on the blood of the workers and periodic physical examinations are made.

# Bond of Plastics and Plywood Cemented at Seattle Meeting...

**P**LASTICS and plywood people got together in Seattle July 13 and 14 in the first conference of its kind ever held, and exchanged views on their common interests and problems. Co-sponsors of the meeting were the Society of the Plastics Industries, Inc., and Douglas Fir Plywood Association, the latter being a Pacific Northwest association. Highlights of the meeting are given in the following abstracts of addresses:

## New Bonding Method

(Dr. W. Gallay of Ottawa, Canada, former director, National Research Council of Canada, now a consultant on adhesion and bonding techniques developed by him and already used commercially.) Utilizing low-voltage electrical current and simple equipment for a heat source in setting adhesives.

Method based upon introduction into the glue line of plywood of a resistor (acetylene black) so as to obtain heat from electrical energy in the same manner that the resistor wires heat an electric toaster. Introduced because synthetic resin glues are poor conductors of electricity and fail entirely of conduction when they dry out so they can't be used as resistors.

Essentially a mixture of glue and acetylene black. Use that as a glue line, put contacts along the edges, place the panels in an ordinary cold press, pass through low voltage ordinary current and in a few minutes the plywood is bonded. To assure uniformity of spread of the acetylene black, a coarsely woven fabric, resembling mosquito netting, is impregnated with the black and placed between the plies of wood.

## Molding Developments

(T. S. Carswell, Monsanto Chemical Co., St. Louis.) Three new techniques: (1) resin-pulp molding. Pulp preform offers the possibility of greater strength per unit

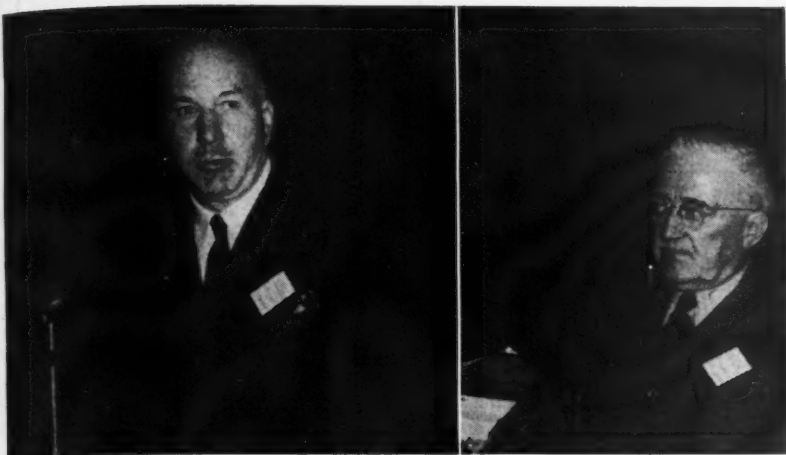
section than conventional molded objects. Largest resin-pulp preformed objects now in commercial production are approximately 2 x 3 x 1 feet. (2) Low pressure laminating. New military requirements have resulted in a series of rapid developments in the reduction of laminating pressures and in a remarkable increase in the complexity of forms which can be produced. Developments have been along two lines, improved fillers and improved resins; the results are improved structural and tensile strengths. (3) Postforming of laminates. This method economical when a limited number of parts is required and provided contours are not too deep. Postforming permits standard flat sheets being stocked at the point of parts manufacture.

## Relation Between Plywood And Cellulose Plastics

(J. K. Speicher, Cellulose Products Department, Hercules Powder Co., Wilmington)



• AT THE PLASTIC-PLYWOOD WEDDING. Top row, from left: William T. Cruse, executive vice-president, Society of the Plastics Industries, Inc.; W. E. Difford, managing director, Douglas Fir Plywood Association; T. S. Carswell, Monsanto Chemical Co. Lower row: Roy Peat, Plastic and Die Cast Products Co., Los Angeles, chairman of the dinner session, introduces Dr. W. Gallay of Toronto; George F. Russell, Northwest Syndicate, Inc., Tacoma; N. S. Perkins, Tacoma, technical director, Douglas Fir Plywood Association.



• Dr. Nathanael H. Engle, director of Bureau of Business Research, University of Washington, and E. W. Daniels (right), president of Harbor Plywood Corporation, Hoquiam.

ton, Del.) Both products based on cellulose. "In the plywood industry the cellulose is retained in its natural form; in forming cellulose plastics we separate the material from other components of wood and then react the fibres chemically. Both plywood and cellulose plastics obtain their strength characteristics from the same source. Military demands have brought a wider useful temperature range, better dimensional stability, less cold flow and better strength properties. Prior to the war research and development largely directed toward better color and clarity and color stability; the military has demanded to know about physical properties, such as toughness at very low temperatures, that had never been considered before."

#### Phenolic Plastics Possibilities

(H.B.DeWaide, Bakelite Corp., Bloomfield, N.J.) Four general classes of phenolic molding materials: general purpose, shock-resistant, heat-resistant and special materials including transparent phenolics and "non-squeak" molding compounds. New method of heatronic molding employing the use of high-frequency current in an electrostatic field as the source of heat provides a rate of cure, independent of thickness and without sacrificing thoroughness of cure. Phenolic plastics will find their way in the home of tomorrow as adhesives for plywood wall sections, phenolic resin-impregnated paper overlays and as a base for paint and protective coatings.

#### Mutual Interests

(N.S. Perkins, technical director, Douglas Fir Plywood Association). Plastics have three places in plywood. Plastics can go into the veneer (thin sheets of wood that are joined to make plywood), between the veneer (as adhesives) or on top of it. Plastics can even go on the edges of the panels. Defined "plastic-plywood" in describing panels surfaced or covered with a plastic coating. These are new, but plastics in the

form of phenol formaldehyde adhesives have been used for ten years as the glue bonding together the plies in Exterior (waterproof) type fir plywood.

#### Plastic-Finished Plywood

(J. D. Long, chief research Douglas Fir Plywood Association). Plastic overlays are currently the plastics application of greatest interest to the plywood industry. The plastic surface may be attained by self-bonding overlays of resins or by gluing on a pre-cured surface sheet. Overlaid panels potentially have widespread applications in the future. May be used for railroad cars, walls in bathrooms, furniture, signboards. If further developed they may even become pre-finished walls for homes.

#### Production Problems

(John Ritchie, chief inspector, fir plywood industry). If plastics manufacturers have in mind new adhesives they will have a rigid standard to meet in seeking approval of the plywood industry. If they contemplate combining plywood and plastics will need to develop a material which will stand up under the tests to which the plywood glue line is subjected.

#### Parallel Bonding

(George F. Russell, Northwest Syndicate, Inc., Tacoma, manufacturers of electronics machines). Radio frequency heat energy has become a modern tool of the lumber and plastics industry. High-temperature drying of lumber with high-frequency electricity is one example; parallel bonding in timber lamination is another. Radio frequency high temperature technique reduced from 48 hours to 20 minutes the time required for reducing the moisture content of 2 x 4-inch lumber used in laminated gluing of door stiles, reducing the moisture content of the wood from 10 per cent to 5 per cent. "Hi-temp" drying has not yet experienced day-to-day ordeals of commercial operation.

Original operations of bonding materials with radio frequency placed alternate layers of wood and glue in the field with the force between the electrodes perpendicular to the respective glue lines. Parallel bonding differs in that the panels are placed with the glue lines parallel to the field to allow concentration of the entire effect of the field on the glue joint.

In some cases it has been found that in thick laminations only a small portion of the heat from the radio field is required to set a given package by the parallel bonding method as is required by the perpendicular process.

#### Plywood—Prefabrication—Plastics

(W. E. Difford, managing director, Douglas Fir Plywood Association). Prefabrication as a system of construction has become a reality; it brings maximum utilization of material. And in this field plywood has led because plywood bonded to light framing members produces walls of exceptional strength. Plastics may even provide a permanent finish for these prefabricated plywood homes.

#### Plastics Industry at War

(William T. Cruse, executive vice-president of the Society of The Plastics Industry, Inc.). 1942 production of plastics totaled 468 million pounds; in 1943 it reached 900 million pounds.

#### Cut-Backs In Light Metals

With not only aluminum, but also magnesium, "running out of our ears," further cut-backs in production have shut down entirely the aluminum plant at Riverbank, California, lopped off one of three aluminum pot lines at Torrance, Calif., pinched off two of Basic Magnesium's units and reduced Electrometallurgical at Spokane to 30 per cent of capacity. The last is a cut of 1,100,000 lbs. per month.

The Riverbank DPC plant, operated by Alcoa, is admittedly a high cost plant. Two pot lines were running there. None of the aluminum plants in the Northwest were touched.

National stockpile of magnesium is over 100,000,000 lbs., and the Dow magnesium plant at Marysville, Michigan, has also been closed entirely, while production has been curtailed at the other Dow plants at Velasco and Freeport, Texas, and Midland, Michigan. BMI was previously cut from ten cell houses to six, and the reduction to four units brings monthly BMI production to between 4,000,000 and 5,000,000 lbs.

At the same time, DPC granted BMI's application for \$350,000 for development purposes, of which \$150,000 will be used for operation of existing experimental facilities and \$200,000 for operation of sand casting and permanent mold casting and for the development of uses of magnesium.



# Reconversion Picture Seen From Washington

WASHINGTON, D. C.—Out of the confused welter of cross-purposes and contradictions the solid fact seems to emerge clearly that you were losing approximately 100,000 workers per month recently, and that these workers are going back to the mid-west and to the east



to get peacetime jobs before the veterans come home. Also, it seems clear you are expected to supply somewhere between 80,000 and 150,000 new workers for the fresh jobs the Army, and especially, the Navy say must be

done, beginning some time between September and November.

If this reporter were to attempt to break down the figures into relative quotas for the four areas of the Coast he would become just as screwy in his cerebration as some of the people he knows in Washington. Not that any one blames them for what they may do or think in this stupefying heat and this bewildering tangle of complications; but safety lies in getting far enough from the forest so you may not see too many trees.

Another outstanding fact, that most of our own Western people apparently hate to see and hate to realize, is the inevitable

By ARNOLD KRUCKMAN

conclusion that the West Slope, particularly the West Coast, will not be given many opportunities to reconvert to civilian production until the Pacific war is finished. It just is not common sense, from the military point of view, to release facilities either needed, or that may be soon needed, for war, to any other use.

Your situation directly ties up with the same philosophy which strives to keep the manpower of the nation as a stockpile for preferred war production. When you once clearly grasp that the military folk correctly reason that a modern total war is not finished until the enemy surrenders, you will understand why they are so vigorously opposed to Nelson's effort to start even a mild civilian production.

## Must Smother the Enemy

Discussion about the validity of this group of production figures and that group of figures, sponsored by WPB or Army, at this moment seems to some of us just as futile as the debates of the early philosophers who almost upset the world because they could not agree on how many angels could dance on the point of a needle. The figures apparently do not mean anything until the happy time when the armed forces need no more supplies.

The question does not appear to mean whether or not the percentage is kept on an even keel, it means that the armed forces need even more than 100 per cent production; they need surplus, and then more surplus, to smother the enemy by the very weight and volume of our armor, equipment, shells, and every other kind of munitions. Bear in mind the armed services do not merely think in terms of ultimately forcing the enemy to quit, they seek to drown him in the tidal wave of our armament so that he will quit as quickly as possible, in order to save as much of our manpower on the battlefronts as possible, and to strangle the war.

Apparently they reason logically, like the surgeon, that you cannot help hurting the patient to cure the sickness. The enemy is not the patient they have in mind; we home folks are the patients, and if the swift and successful operation means that we must suffer some deprivations and some economic and social dislocations after the war, the distress and pain we suffer is the inevitable price we must pay for a quick cure.

With this idea firmly in mind you may more clearly understand why you out there may be held to the limited activities of war production, why your smaller plants may be forced to stand still even when the east begins to produce for civilians, and why at this time the larger part of the national economy may be kept at low production in order that manpower may be forced to work in war plants.

## Herron to the Bat

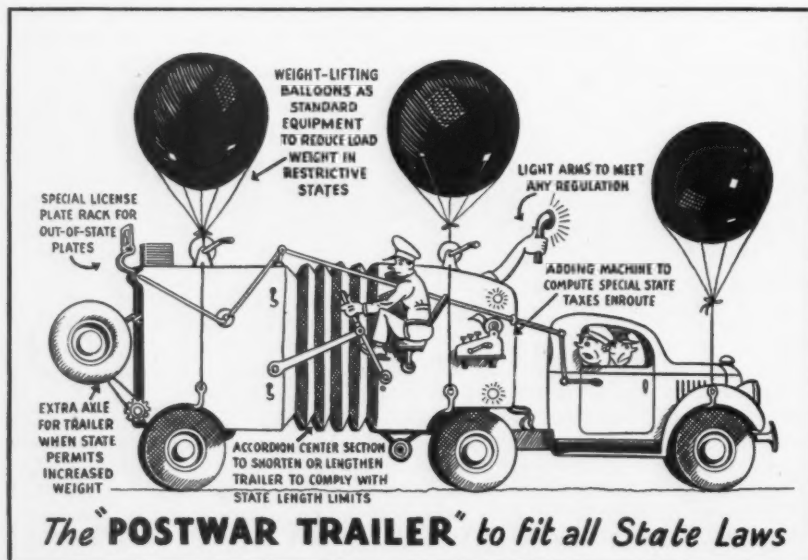
All this may not be palatable information, but it should enable you to understand why your faithful representatives in Washington have such difficulties in reconciling your wants and your needs with the overall current national program. W. G. Herron, the Los Angeles Chamber of Commerce man in Washington had secured his reservations to make an urgent autumn trip to the Coast, when Assistant President Burns issued his startling directive which put the Coast very much on the spot.

This is the document which gave Manpower Administrator McNutt the authority to veto any industrial program that might interfere with war production. It glaringly revealed your lack of the manpower which the armed services said they would need for urgent services more or less immediately, and it obviously indicated that the Nelson "spot authorization" could not be applied to your smaller production units, even those which employ 50 workers or less.

In fact, it was quite clear you might find that every smaller plant engaged in non-essential activities might be deprived of 75 per cent of the help they now employ. Other representatives of Chambers of Commerce on the Coast had left for necessary trips back home.

Herron gathered those who were left

(Cont'd on Page 44)



• Ike Doodlesmalz, M.E., D.D.S., independent industrial engineer de luxe, has submitted this design to Fruehauf Trailer Co. Here is what we have out West: Maximum gross weights: California, 76,000 lbs.; Oregon, 54,000 lbs.; Washington, 68,000 lbs. Lengths: Calif., 60 ft. truck and trailer, single unit 35 ft.; Oregon, truck and trailer 50 ft., tractor semi-trailer 35 ft.; Washington, 60 ft. Height: Oregon: 11 ft. Other Western states same as California for preceding. Oregon, only bottleneck on the Pacific Coast, now grants California weight up to 68,000 and 13 ft. 6 in. height for the duration.



# Solutions

## TO YOUR TOUGH INSULATING PROBLEMS!

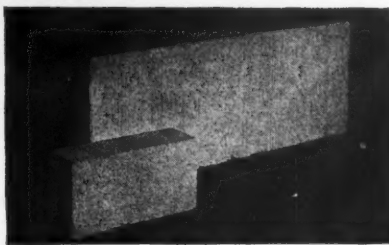
**W**HATEVER your insulating problem, there's a Johns-Manville insulation that can solve it efficiently and at minimum cost. For, over the past 86 years, J-M's extensive laboratories have pioneered in the field of industrial insulation. Today J-M offers a wide line of insulating materials, each designed for some specific insulation need, for temperatures up to 2600°. For example:



**For temperatures to 600° F.** J-M 85% Magnesia has been for many years the most widely used block and pipe insulation for temperatures to 600° F. and, in combination with Superex, for higher temperatures. Maintains high insulating efficiency. Standard block sizes 3" x 18", 6" x 36" and 12" x 36"; from 1" to 4" thick.



**For steam lines up to 700° F.** Use J-M Asbesto-Sponge Felted Pipe Insulation for efficiency, high salvage and resistance to abuse. For temperatures over 700° F. use with Superex. In 3-ft. lengths 1" to 3" thick.

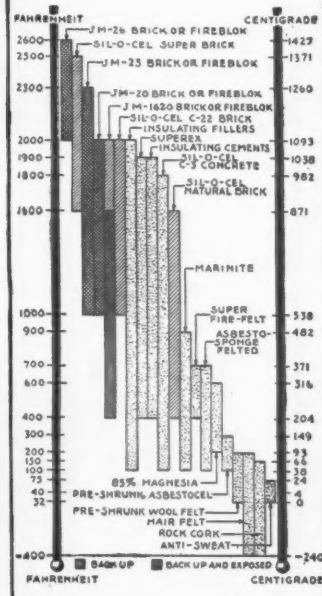


**Furnace insulation up to 2600° F.** J-M Insulating Brick and Insulating Fire Brick are available in 7 types, temperature limits from 1600° F. to 2600° F. All provide light weight, low conductivity. New Insulating Fireblok, now ready in all four Fire Brick types, are 5 times larger for speedier, more economical installation.



**Insulation for temperatures to 1900° F.** J-M Superex Blocks have long been standard for this service. High heat resistance, low thermal conductivity. Sizes 3" x 18", 6" x 36" and 12" x 36"; from 1" to 4" thick.

### J-M INSULATIONS COVER THE ENTIRE RANGE OF INDUSTRIAL TEMPERATURES



For more details on these materials, and on the complete J-M Insulation line, write for Catalog GI-6A. Address: Johns-Manville, Los Angeles, San Francisco or Seattle.

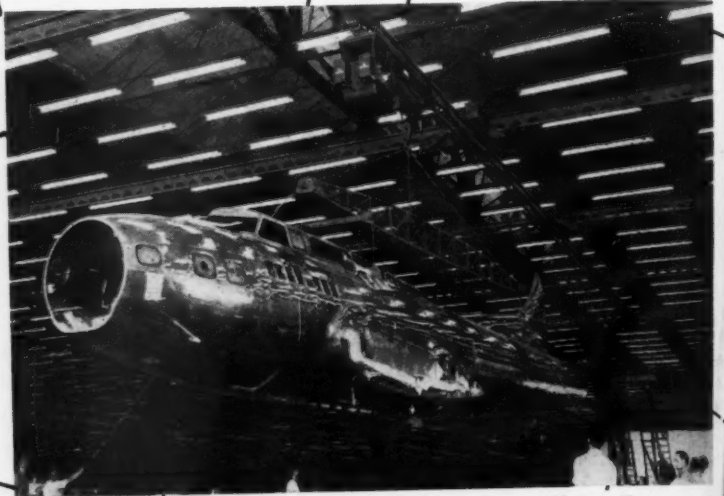


## Johns-Manville INDUSTRIAL INSULATIONS

FOR EVERY TEMPERATURE... FOR EVERY SERVICE

# HUNDREDS of SPEED

SEATTLE  
TACOMA  
SPOKANE  
PORTLAND



Five runway cab-operated crane (123'-0" length) handles B-17 Bombers (Boeing) at Vega Aircraft Corporation, Burbank, Calif.

SACRAMENTO

OAKLAND  
SAN FRANCISCO



Inexpensive hand propelled crane with electric hoist handles heavy timbers at fraction of former cost at Hammond Lumber Co., Los Angeles, Calif.

LOS ANGELES

SAN DIEGO



Four separate cranes and runways around the furnace at Coulter-Sibbett & Burke Steel Co., Los Angeles, speed forging operations and reduce fatigue of workers.

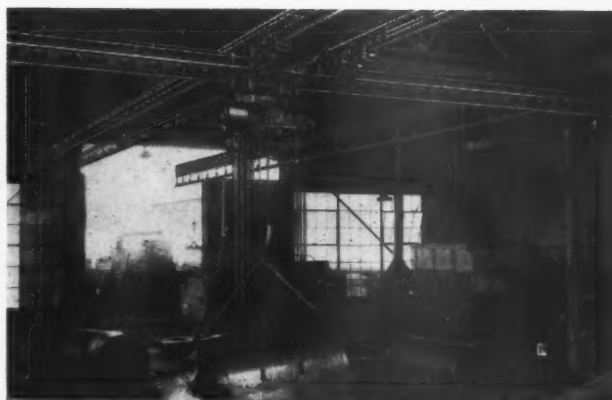
# of CLEVELAND TRAMRAIL Installations D PRODUCTION on WEST COAST . . .

One of the many indications of the keenness and aggressiveness of West Coast manufacturers is the large number of installations of Cleveland Tramrail through California, Oregon and Washington. The foresight of these concerns in making studies of movements of materials and installing Cleveland Tramrail has provided them with many important advantages inherent in overhead materials handling equipment.

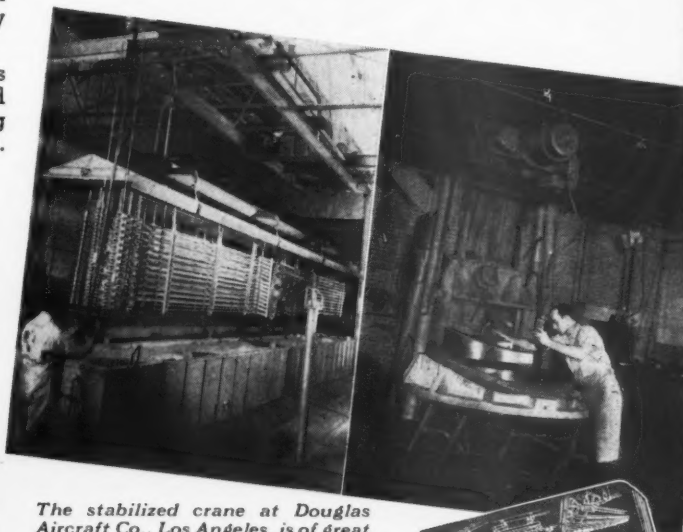
The hundreds of installations are of every type and size from small inexpensive hand-propelled equipment to tremendous plant-wide electrified systems. Regardless of their size or the industry they serve, each installation is speeding production, lowering cost, improving safety or providing other important advantages.

If your work involves the movement of materials whether between two points, or from step to step in the process of manufacture, most likely Cleveland Tramrail can help you. There is a complete line of hoists, carriers, rail, switches, grabs and necessary accessories for every purpose.

Now is the time to make studies of your materials handling methods. Check with your local Cleveland Tramrail representative. He knows materials handling and will be glad to offer suggestions without obligation.

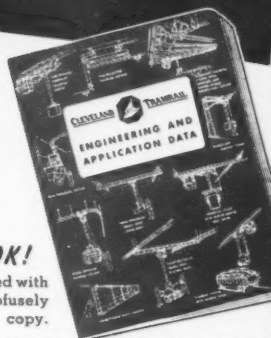


*Transfer bridges permit complete floor coverage with electric hoist at Pomona Pump Co., Pomona, Calif.*



*The stabilized crane at Douglas Aircraft Co., Los Angeles, is of great advantage for anodizing operations because it lowers and raises loads without swinging them.*

*This Tramrail equipment at Boeing Aircraft Company, Seattle, Washington, handles dies in half the time formerly required with greater safety.*



**GET THIS BOOK!**

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy.



*In this steel warehouse in San Francisco, thirty-two 100 lb. kegs of nails, bolts, etc., are handled per lift with the cab-operated crane.*

## CLEVELAND TRAMRAIL

THE CLEVELAND CRANE & ENGINEERING CO.

WICKLIFFE, OHIO.

LOS ANGELES—  
Cleveland Tramrail Los Angeles Co.  
5649 Alhambra Street  
Los Angeles 32, Calif.  
Phone: Capital 8103

SAN FRANCISCO—  
Cleveland Tramrail San Francisco Co.  
82 Beale Street  
San Francisco 5, Calif.  
Phone: Yukon 1941

PORTLAND, ORE.—  
Spencer Machinery Co.  
1115 N. Glisan Street  
Portland 9, Ore.  
Phone: AT-9391

SEATTLE, WASH.—  
Cleveland Tramrail Seattle Co.  
2207 First Avenue, South  
Seattle 4, Wash.  
Phone: Elliot 3424



**KRUCKMAN** (Cont'd from Pg. 40)

who represent Seattle and Portland, and got together with Congressman Izak of California in order to have a heart-to-heart talk with the war secretaries and some of their conspicuous generals, and the Navy secretaries and some of their admirals. The WMC people also were summoned to the conference, and the shadowy figures at the White House, who influence national policies, were consulted.

But in the absence of the key men on the Hill the conferences were inconclusive. Some of the key men will probably not return to Washington for weeks; others will

not be in Washington until later in August. Any decisive action therefore still is unpredictable.

#### Theoretical Reconversion

The grapevine seems to indicate that Nelson's "spot authorizations" program, scheduled for August 15 release, will be merely a shell without any real effect. An order will be issued, and it may have some face-saving enamel, but it seems entirely certain that civilian production will not be given any blood-transfusion that will enable it to take on real life either on the Pacific Coast or elsewhere.

McNutt always has leaned towards the

armed services, and McNutt always has clearly felt that it is of little moment whether the east starts production before the West, or whether Big Business gets a head start, or whether the pre-Pearl Harbor units get preference for reconversion before the competitors who came into existence during the war. McNutt apparently thinks the primary business of the War Manpower Commission is to keep war production going at the speed and the volume required by the armed services.

All this has been as clear as crystal in all previous WMC policies and actions. And it seems equally plain that this has been the over-all policy of the White House, when you bear in mind that each time Charles E. Wilson made clear that he was fed up and wished to go home to General Electric the White House induced him to stay. Only the other day, after the latest tangle with Nelson, the White House again persuaded Wilson to remain.

Relations between Wilson and Nelson have been strained for months. Wilson sincerely thinks in terms of Big Business and big sweeping actions. He logically sees eye to eye with the Army people, and has never made any bones about his attitude. Nelson comes from Big Business, but apparently has a genuine appreciation and sympathy for Smaller Business. He is closer to the ultimate consumer than he is to the production industrialist. He is essentially a retailer. And since the days of Eberstadt he has been at definite odds with the armed services.

#### Nelson's Position

Nelson has a flair for politics. He is exasperating to many of his associates because he has the political flexibility that enables him to bend and yield in political storms; but also he recovers his stance when the hurricane has passed.

The biggest fight he has ever faced was the recent conflict with Admiral Leahy, in which Leahy apparently was licked. Nelson's stubbornness in this fight surprised his friends here. Unless present signs are haywire, however, that victory was more apparent than real. The portents are that we are entering the ultimate phase of absolute and total war, so far as the control of the national economy is concerned.

It has apparently been Nelson's sincere conviction that despite war, hell, or high water, the complete subordination of the civilian economy to military direction is incompatible with democratic principles. It is curious that recently several WPB division heads have flatly warned industries, such as those who make paper, that unless they voluntarily provide the supplies required by the Army, it might be necessary for the Army to issue directives to compel production and delivery of the required supplies.

#### Navy Could Pay More

Some of Nelson's friends have raised the question whether or not such directives

(Cont'd on Page 46)



## How would you divide it?

Would you divide it in equal parts or would you let each one take just what he wanted?

We are not talking about cake but about industrial chemicals. There is only so much and it must be divided so that everyone gets a fair share—a share large enough to continue efficient production in the war effort.

Sometimes this division of industrial chemicals is decided by arbitrary government allocation. More often it is left to the good judgment of the chemical manufacturers.

Long ago STAUFFER scrapped the old rule "first come, first served" and established a plan of dividing deliveries—a little here, a little there—always working out with the customer his problem of continued efficient operation. This is not the easiest way for us, but it is proving the best way of taking care of everybody — of "dividing the cake" so that each receives his just share.



# STAUFFER CHEMICAL CO.



# FRIDEN

## FULLY AUTOMATIC CALCULATOR



**Visible Fully Automatic Multiplication...a patented Friden Feature, makes completely Automatic Multiplication a reality.**

Set either factor of any Multiplication problem on the Keyboard. Then enter the other factor in the Multiplier. For either Positive, Negative or Accumulative Multiplication just touch ONE KEY...and presto, the Carriage is automatically positioned, the Dials automatically cleared, the Calculator automatically counts and shifts until the problem has been completed...then finally clears the Keyboard preparing the machine for any subsequent calculation. Friden Calculators are AVAILABLE when applications for deliveries have been approved by the War Production Board. Telephone or write to your local Friden Representative for complete information.

*Friden Mechanical and Instructional Service is available in approximately 250 Company Controlled Sales Agencies throughout the United States and Canada.*

**FRIDEN CALCULATING MACHINE CO., INC.**

HOME OFFICE AND PLANT • SAN LEANDRO, CALIFORNIA, U.S.A. • SALES AND SERVICE THROUGHOUT THE WORLD

## KRUCKMAN (Cont'd from Pg. 44)

could be made to apply to any phase of the manpower problem. Our friends here from the Coast come back to that one by suggesting that the armed services might solve some of the manpower problems on the Coast by paying the men who work for the Navy \$1.00 an hour for unskilled labor. The Navy now pays 70c an hour.

Moreover, it has been suggested that the armed services make it a part of their contracts that men work ten hours a day, during the emergency, which would greatly augment the pool of man-hours.

These suggestions would scarcely emanate from the Nelsonian group. They are not social liberators or close friends of the

do-gooders in Government, but they have sound political intuitions. It is this quality that has earned Nelson so much support on the Hill. Senators, such as Murray and George, appreciate Nelson, as do Congressmen like Patman, and men like Maury Maverick. And it is this innate political quality of Nelson that has made possible his survival.

In the end they must all go to the Hill. There is no money and there is no real ultimate backing in this democratic government unless it comes from Congress.

Possibly this may be the answer to some of your troubles. Even though the genius of the Coast is brilliantly reflected in Big Business constellations, you are essentially

an area of smaller business. Every one in the United States knows about the 6,000 or more smaller business units that cluster in Los Angeles.

It is the effect of this great aggregation of smaller business units, from San Diego to the Puget Sound, and back as far as Denver, that makes the present situation so dangerous to the future of the economy of your whole slope area. There are something like 325 similar areas in the United States. Of this number there are 185 in the so-called Critical Labor Group Areas No. 1 and No. 2.

### Cooperating With Other Areas

These 185 areas, with many smaller business units, are not as badly hit as you are; but they have thousands, hundreds of thousands, smaller business units, and they are hit hard. They also are largely short of their help, and of materials. They need relief as much as you do, and they find themselves generally in somewhat the same position in regard to the potential prospects.

Moreover, the 140 areas in No. 3 and No. 4 Groups also largely are made up of smaller business units, and, even though they are located in easier labor areas, the tendency is just as acute. Reductions in employment ceilings, shearing as many as 75 per cent of their workers from the payroll, apply to these areas as well as to the others.

All the men and women who conduct these businesses have influence. Their problems have been much to the fore with their Congressmen and Senators. Their needs and their wishes have enormous political validity in these pre-election times. There are at least 30 or 40 committees on the Hill which have devoted time to their business.

It is easily conceivable that when the smaller business people of these 325 areas, representing every section of voting strength in the country, collectively present a formula which will not hurt the war effort and which will help the troubles that beset them, this urgency, from thousands of influential voters, will spur the members of Congress to discuss the formula with the members of the various agencies of the Government. It is quite possible such action might secure the remedies you need without legislation.

Naturally you will need a formula, as a basis of discussion. The formula must not involve any remote interference with the war or the production for the war. It must help the armed services. And the more it helps the bedeviled folk in WPB, WMC, in the Byrnes end of the White House, the easier it will be to secure its adoption. It would be presumptive for this reporter to suggest the terms of the formula. If you want a simple one, consult the Washington representatives of the San Francisco, Los Angeles, Seattle, Portland, and San Diego Chambers of Commerce. Above all, ask Bill Herron.



### Use a Browning **GRIPLINK** Belt...

With Browning Griplink, adjustments are made almost instantaneously by merely adding on or removing one or more links. Neither fixed centers nor stretch offer a serious problem when your machine is driven with a Griplink belt. And you can often avoid a costly shutdown if you can replace a drive without having to tear down an entire outboard bearing assembly! Griplink can be supplied from stock in all standard V-Belt Cross sections.

Browning dealers are located in most towns and cities throughout the Pacific Coast. Write to us for the name and address of your nearest Browning dealer.

# MARWOOD

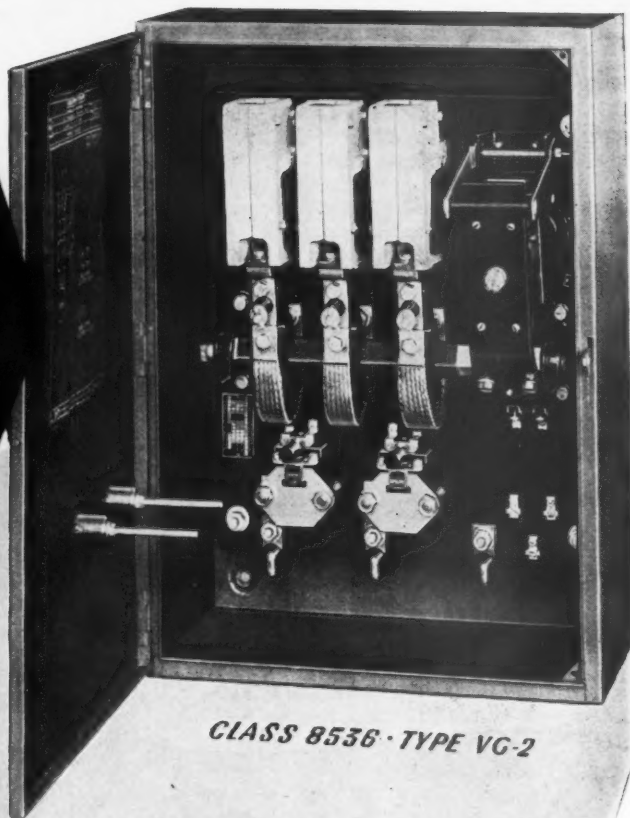
LIMITED

Representatives for Browning Manufacturing Company

SEATTLE . PORTLAND . SAN FRANCISCO . LOS ANGELES

881

# AN Improved SIZE 4 STARTER WITH FIVE NEW FEATURES



CLASS 8536 · TYPE VG-2

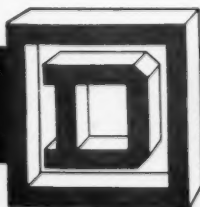
-----SMALLER-QUIETER-----

- 1 Improved blow-out coils have fewer turns and are wound with heavier copper—assuring less heating effect, and efficient interruption of stalled rotor currents for electric motors up to 100 H.P.
- 2 New shading coil affords exceptional mechanical strength. This coil is held in place by the magnet coil in such a manner as to prevent its falling out. Use of heavy brass ribbon makes shading coil virtually unbreakable.
- 3 New and larger magnet of modified "E" type construction gives added efficiency.

- 4 Self-aligning, floating armature eliminates vibration noise—reduces heating and magnet wear.
- 5 Narrower panel saves space and flat door cabinet permits gang mounting.

*This improved Type V device is available in a complete range of enclosures for all Size 4 starter applications, including reversing, combination, multi-speed, reduced voltage, etc.*

**Contact your nearest Square D Field Engineer or Square D Electrical Distributor.**



**SQUARE D COMPANY**

LOS ANGELES

• DETROIT

• MILWAUKEE



# WESTERNERS AT WORK...

## Arizona

P. D. Honeyman promoted from general superintendent Inspiration Copper Co. to assistant general manager.

## California

E. O. Locher, newly appointed manager of Airplane Manufacturing & Supply Corporation, Glendale. . . . K. C. Tripp, district manager, Moore-McCormack lines in Portland advanced to position of Pacific Coast manager, headquartering in San Francisco. . . . Ralph T. Fisher, v.p. American Trust Company named chairman of

Oakland Committee for Economic Development. . . . Dick Carlson, former director of Personnel Research Bureau in San Francisco and instructor in U. C. Extension division, elected president of Society of Personnel Administration in nation's capital. . . . Harry Irving, San Francisco, presides over California Sardine Institute following his election as president. . . . F. E. Rehm, now vice-prexy of Shell Oil Company, officiating in San Francisco. . . . Charles R. Baird takes office as regional administrator of OPA, succeeds Leo F. Gentner who resigned to become exec. of

confectionery firm. . . . Thelma Swank Ostrow succeeds Mary Jackson as Director of Counseling for Consolidated Values, heading women's counseling activities. . . . Rilea W. Doe, vice-pres. of Safeway Stores, Inc., appointed member of United States Chamber of Commerce, Domestic Distribution Department Committee. . . . OPA names Bay district men to represent Western mixers, A. J. Flebut, v.p., California Spray-Chemical Co., Richmond; R. A. Lamoree, general sales manager, Stauffer Chemical Co., San Francisco; and D. A. Zannette, Western Manager, Chipman Chemical Co., Palo Alto. . . . Douglas C. McKay, Nevada mining man, doing business in San Francisco after serving in armed forces in Pacific. . . . Joseph H. Hart, chief chemist of Kelite Products named laboratory director. . . . Fred Carpenter, former factory manager of L. A. tire plant of U. S. Rubber Co. appointed manager of the company's synthetic rubber plant. . . . Kenneth A. Smith, formerly administrative procurement inspector, Army Air Forces now project engineer Gille Bros., Los Angeles. . . . A. R. Bone, Jr., newly elected regional vice-president, American Airlines, Inc. . . . OPA appoints two California lumbermen to industry advisory committee, P. V. Burke of Sacramento Box & Lumber Company and Otis R. Johnson, president of Union Lumber Company, San Francisco. . . . Emil Rutz of Schuckl & Company, Sunnyvale, announces John E. Dodds, (Chief Processed Fruit & Vegetable Division of WFA) as general salesmanager, George Clement named vice president. . . . Chris Rodegerdts of Pacific Can Co., San Francisco, named western member of Manufacturers Advisory Committee. . . . Frank H. Sloss becomes regional price executive for OPA succeeding James K. Hall and Kenneth R. Hammacker, formerly secy. manager of California State Fair, assistant. . . . James L. Straight now manager of Aircraft Manufacturers Council of Aeronautical Chamber of Commerce, Los Angeles. . . . Paul I. Nederman resigns district rationing executive job in San Francisco for private business with Kenneth R. Lowell taking over duties. . . . Holley R. Smith of Seattle now assisting Robert Crowe, regional director in San Francisco of Highway Transport Department. . . .

## Oregon

E. R. Durfee promoted to secy.-treasurer of Monolith Portland Cement Co. and Monolith Midwest Co.; P. A. Carmical named assistant. . . . Roland J. Schmitt, Indianapolis, appointed Pacific Northwest manager of E. J. Atkins & Co., headquarters in Portland, directs activities in Oregon, Washington, Idaho and western Montana. . . . Harold Olson, Portland, appointed western manager of American Forest Products Industries, Inc. . . . Sam E. Fletcher, due to his company's responsibilities, resigns as president of Columbia

(Cont'd on Page 50)

## Ingenious New Technical Methods

Presented in the hope that they will prove interesting and useful to you.

### Amazing New Four Spindle Turret Attachment for Drill Press!

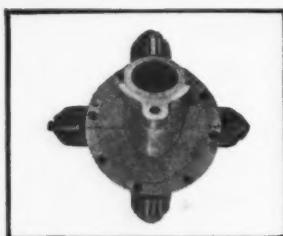
Now one drill press can do the work of four and, at the same time, effect a savings of up to 75% in floor space, with the "Quadri-Drill" attachment. This rotary device will accommodate four boring or cutting tools at the same time, yet one tool only is in motion when the head is in operating position.

The entire unit is assembled to the quill of the drill press and is driven from the drill press spindle. Accuracy and rigidity of alignment of the "Quadri-Drill" are assured by the special construction of the driver and spindles, thus efficiency is only limited by the accuracy and power of the drill press itself.

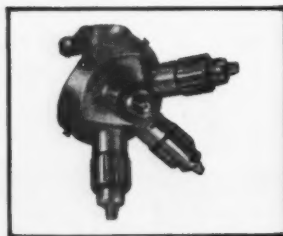
foolproofing in indexing is accomplished by visual markings and by the relationship of the index pointers on the index disc, as well as the extension of the spring retainer. Four hardened and ground spindles are fitted for No. 32 Jacobs chucks or their equivalent. To provide correct positioning at all times, the entire spindle assembly is located by means of an accurate fitting of recess and undercut, between turret and bearing housings. The hardened friction starter and driver have been so constructed that at any speed proper synchronization of the driver teeth is accomplished without clashing.

It goes without saying that our fighting men must have the finest possible quality materials home industry can produce. So, although the stock of quality raw materials from which Wrigley's Spearmint chewing gum is made is growing steadily smaller, they are still maintaining pre-war standards. However, they can now make only a portion of their former output, so all of this limited production is going to our fighting men and women overseas only . . . where it is an "on-duty" need.

You can get complete information from Chicago Driller Corporation, 919 N. Michigan Ave., Chicago 11, Ill.



Quick and positive indexing assured by pointers on index disc



Quadri-Drill assembly complete ready for attachment to drill press

Y-140



# MAKE ONE BEARING OUTLIVE TWO!

One plant that regularly had two or three bearing failures a month writes us, "We have had only one bearing failure in five years since using LUBRIPLATE"... another writes, "Pulled our ball bearing temperatures down from 170° to 130°F"... still another, "If LUBRIPLATE cost \$1.50 a pound we could still afford to use it."

## BALL BEARING LUBRIPLATE

Over a period of years this outstanding grease type lubricant has reflected superior performance on the general run of ball and roller bearings operating under normal conditions at speeds up to 5,000 R. P. M. and temperatures from zero to 300 degrees F.

Long time users of BALL BEARING LUBRIPLATE everywhere attest to its superiority in providing cool and quiet operation—protection against corrosion, and of major importance, substantial reduction in bearing replacement costs.

Write today for your copy of Bulletin No. 1-43 containing valuable data on the lubrication and care of anti-friction bearings.

**LUBRIPLATE DIVISION**  
**FISKE BROTHERS REFINING COMPANY**

Newark, N. J. **SINCE 1870** Toledo, Ohio  
DEALERS FROM COAST TO COAST

# LUBRIPLATE

THE MODERN LUBRICANT that Arrests Progressive wear

## 7 FACTS ABOUT LUBRIPLATE

1. LUBRIPLATE produces an ultra-smooth, wear-resisting bearing surface.
2. LUBRIPLATE reduces friction, thus lowering maintenance and power costs.
3. LUBRIPLATE resists rust, corrosion and pitting.
4. Most LUBRIPLATE products are white. LUBRIPLATE assures clean lubrication.
5. LUBRIPLATE outlasts ordinary lubricants many times.
6. LUBRIPLATE is economical—a little goes a long way.
7. LUBRIPLATE is available in fluid and grease types for every need.



## WESTERNERS (Cont'd from Pg. 48)

Empire Industries, Inc., in favor of Thomas C. Young, president Pacific Roofing Company, Portland. . .

### Montana

International Company enters Montana phosphate field naming E. C. Anderson, formerly of potash division at Carlsbad, New Mexico, as resident manager in Drummond; Elza Paul, chief accountant; A. P. Holzworth, mine foreman; C. Sewell Thomas, consulting engineer. . .

### Utah

Tom Lyon, chief geologist for International Smelting and Refining Company,



Salt Lake City now assistant to manager, Frank A. Wardlaw, Jr.; Vincent D. Perry succeeds Lyon. . .

John B. Knaebel promoted from general superintendent U. S. Smelting, Refining &

\* 40 per cent of U. S. wartime shipbuilding output represented here. K. K. Bechtel, pres. Marinship; S. D. Bechtel, chairman Calship; Felix Kahn, v.p., Joshua Hendy, Edgar Kaiser, v.p. and gen. mgr. Oregon Shipbuilding and Swan Island and Vancouver yards, Henry J. Kaiser, pres. Kaiser Company and Permanente.

Mining Co. at Gold Hill to mining engineer at Salt Lake City offices. Old job taken by Don O. Willie, formerly superintendent Hidden Treasure mine at Ophir.

### Washington

William H. Sommers, traffic manager for the North Coast Transportation Co. and veteran Pacific Northwest transportation executive retires after years of service. . . Phillips Dickinson, Seattle, appointed staff assistant of J. W. Clise & Co. . . Robert Duxbury, manager of present Everett plant, will continue as head of Boeing's enlarged facilities. . . C. A. Durham, formerly western division assistant treasurer of Puget Sound Power & Light Co. stepped up to position of statistical engineer. . .

### Wyoming

Eugene Frey, engineer for the U. S. Bureau of Mines is at Laramie, resuming exploration of the Iron Mountain ore deposits. . .

### Associations Elect

National Association of Purchasing Agents elect George S. Drury, Northwest Lead Co., Seattle as vice-president of District No. 1. The Association of Los Angeles elect as president, Al R. Lama, Arrowhead & Puritas Waters Inc.; first vice-president, Gerald A. Selby, Los Angeles Chemical Company; second vice-president, Larry T. Bleasdale, Zellerbach Paper Company; secretary, Dean L. Fisk, University of Southern California. The Association of Oregon elected as president, Gordon T. Hanson, Stimson Lumber Company; vice-president, O. K. Buckner, Electric Steel Foundry Co.; secretary, C. B. Amos, Bingham Pump Company; treasurer, W. F. Gorrell, Munnell & Sherrill, and Utah elected as president, Claude Wheat, Mountain Fuel Supply Co.; vice-president, R. J. Close, Tribune-Telegram; secretary, C. T. Rich, Western Paper Products Co.; treasurer, F. G. Burton, Granite School District.

## HERE'S HOW AND WHY our 400 Spindles Run Continuously on Automatics...



15 Years of  
Progress and Service



## PACIFIC SCREW PRODUCTS CORP.

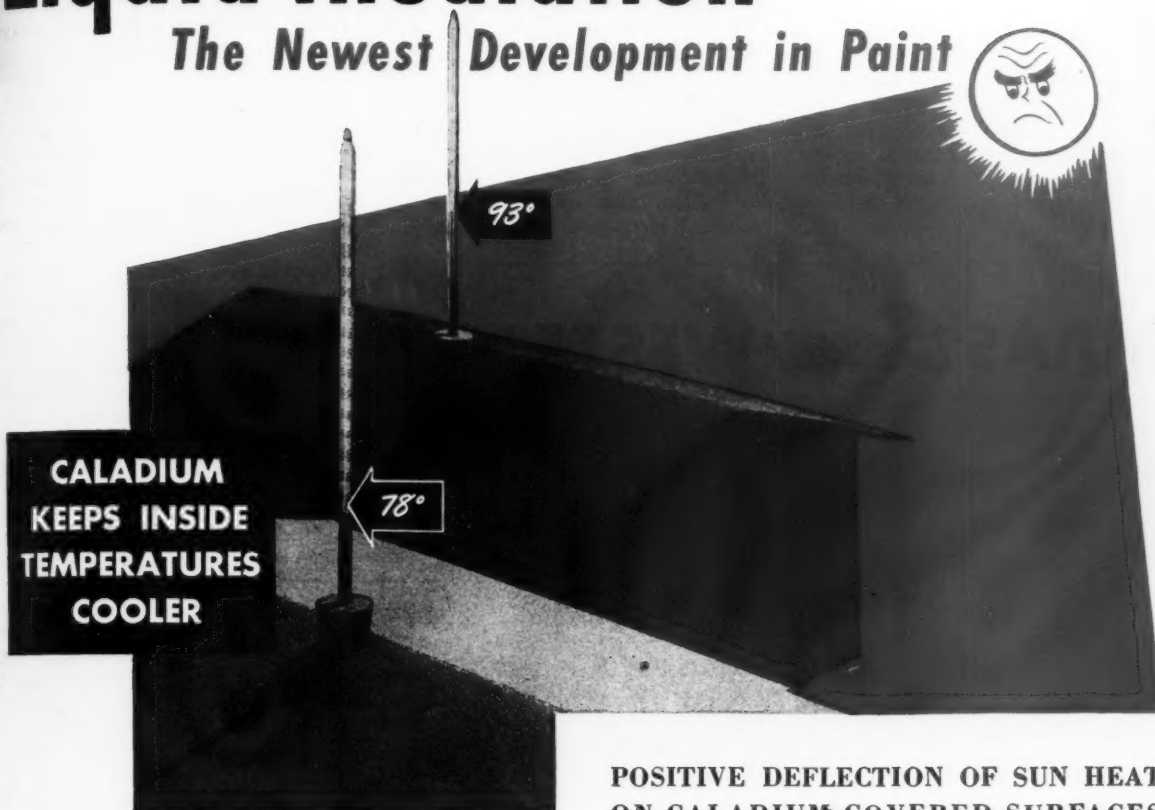
Largest and Best Equipped Screw Machine Plant in the West

5211 Southern Avenue

South Gate, Calif., KI-5211

# Liquid Insulation

The Newest Development in Paint



## CHECK THESE CALADIUM FEATURES:

- ✓ COVERS ALL SURFACES, INCLUDING ASPHALT
- ✓ BLEED-PROOF
- ✓ REMARKABLE SUN HEAT DEFLECTION
- ✓ GREAT DURABILITY
- ✓ AMAZING HIDING POWER
- ✓ EASILY APPLIED—BRUSH OR SPRAY
- ✓ DRIES QUICKLY AND EVENLY
- ✓ WIDE CHOICE OF DECORATIVE COLORS
- ✓ FLAT OR GLOSSY FINISH
- ✓ MAXIMUM ECONOMY

## POSITIVE DEFLECTION OF SUN HEAT ON CALADIUM COVERED SURFACES

Hot weather and blistering sun rays create surface destruction and high inside temperatures that can be reduced by painting with Caladium. This remarkable new *liquid insulation* blocks out the heat rays of the sun with amazing efficiency.

Use Caladium for ALL surfaces, concrete, brick, metal, wood, roofing paper, composition board, etc. It even covers asphalt or other bituminous surfaces without "bleed thru." Further, Caladium is used over any type of painted surface and wherever any other type of paint could be used, including aluminum paint. It provides a super-tough coating that assures greater weather resistance and longer life, a flexible body that prevents cracking of finish. Applied with brush or spray—dries rapidly to a smooth, even finish, and is available in many colors.

Additional stocks of Caladium are available to more adequately meet increasing demands.

**PREMIER OIL & LEAD WORKS**  
3950 MEDFORD STREET, LOS ANGELES 33, CALIFORNIA



# Caladium

PERFECTION IN PROTECTION



# March of Time in the Columbia Empire . . .

**T**HE first shadowy outlines of Portland's "things to come" are beginning to take form and Portlanders aren't sure whether to believe it or not. Local business men and industrialists have privately assumed a hardboiled realistic attitude toward the predicted golden age of Northwest industry that is to follow the war.

In Rotary Club speeches they have painted fantastic Wellesian pictures of the future but in private figuring they have taken a somewhat more pessimistic and cynical stance. Glowing reports of postwar expansion are liberally sprinkled with "shoulds" and "coulds" and notably lacking in "ares" and "wills."

Several events took place during July,

however, that are causing the gloom-mongers to restudy their calculations. In rapid succession Henry Wallace, Eric Johnston, Abe Fortas, and Maury Maverick stormed through Portland hailing it as the postwar hope of the Nation, the land of opportunity flowing with milk and honey, kilowatts and chemurgic marvels.

Then the Chamber of Commerce stalled local citizens by naming Joseph R. McLoughlin, former government statistician, as head of a newly created department of research and statistics. Highly trained in his field, McLoughlin will gather and prepare for presentation every known fact about this area that will aid in promotional activities.

Almost at the same time, Clarence E. Seage, consulting engineer from San Francisco, was hired by the industries committee of the Chamber of Commerce to work for the development of new industries and expansion of existing industries in the area. He will seek to provide the necessary data to induce new firms to enter the field and help present plants to expand.

Seage's appointment represented the first step in the Industry Committee's program for industrial development. His salary will come out of a fund of \$168,000 provided in contributions of local industries and business institutions. Seage will be a sort of industrial salesman and will concentrate his efforts on the biggest of the "most likely" prospects for settlement in this area.

Most stimulating of all, however, was the Senate committee hearings on small business held here on July 28. Over cups of coffee Portlanders had been inclined to abbreviate Portland's industrial future because of the notable lack of an iron and steel industry.

At the hearings many of them awoke with a shock to discover that something new had been added, that this area would not necessarily have to follow the traditional pattern of industrial growth, that maybe iron and steel really weren't going to be needed after all, that maybe it was all talk and rosy dreams about the Northwest's future.

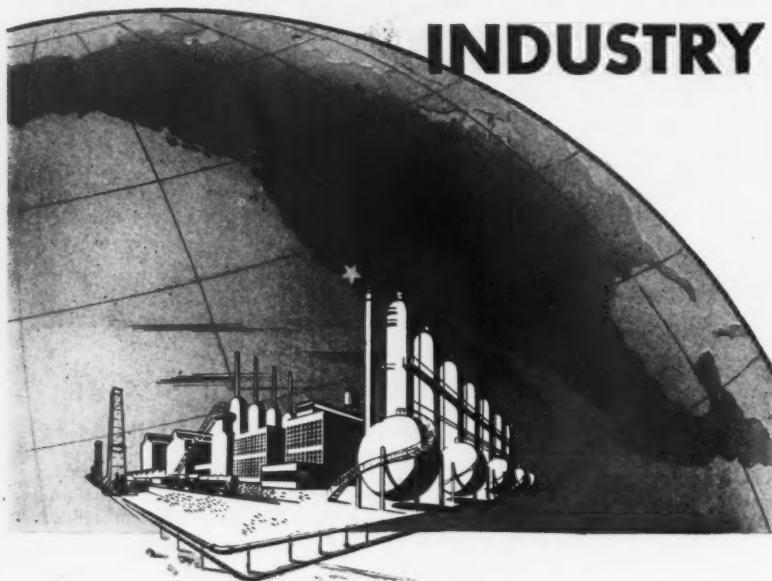
The new thing was chemistry and far-seeing Portlanders took note that they would virtually have to learn a new language well-sprinkled with carbides, sulfates, acetates, cellulose, etc. Lumber men heard their faithful trees described in terms they had never heard of before. It was all rather startling and unreal, yet there was enough actual action reported to disturb the ordinarily yawning pool-poohers.

Edward G. Locke, chemical engineer with the industrial analysis section of the Bonneville Power Administration, summarized six "most favorable" opportunities for chemical industrial development in the area:

1. Cellulose Plastics from Wood Pulp

(Continued on Page 54)

## MAAS *Serves* WESTERN INDUSTRY



THE HISTORY of A. R. Maas Chemical Co. is one of enterprise, stability and service. Year after year it has paced Western industry with improvement of method and facilities—developing uniformity and utility of product.

Today the A. R. Maas Company continues to search for better ways to serve all industry, so that—war or peace—its products will have the perfection that modern production methods demand.

# A. R. MAAS

## CHEMICAL CO.

4517 Ardine Street  
SOUTH GATE, CALIFORNIA

We are proud of our Army-Navy "E" flag with its star—an honor awarded us "for continued outstanding production of war materials."



"ARMed for Chemical Service"



## "I Figured We Needed More System"

Yes, system is good in any business. But being knee-deep in record forms just isn't the answer. What is needed here is not *more* system . . . but *better* system.

And there's where Uarco fits in. Why? Because Uarco records are more than just forms—rather they are functional business tools, scientifically designed to routinize complicated business procedure. They are continuous forms that end record keeping confusion . . . save time and trouble in every division of the business. There's no more copying and re-copying, with Uarco on the job . . . one person at one sitting writes enough copies for all departments.

There are Uarco forms for all types of record keeping problems. They are designed for hand-written or machine-written use. These records may be carbon interleaved or non-interleaved, may be used in a Uarco Autographic Register, typewriter, billing machine or tabulating machine.

No matter what record keeping problem you may have, bring it to Uarco. There is a form, or Uarco will devise one, to fit your need. It will cost you nothing to call the Uarco representative today.

UNITED AUTOGRAPHIC REGISTER COMPANY  
Chicago, Cleveland, Oakland • Offices in All Principal Cities



AUTOGRAPHIC REGISTERS



FORMS FOR  
HANDWRITTEN RECORDS



FORMS FOR  
TYPEWRITTEN RECORDS



FORMS FOR  
BUSINESS MACHINE RECORDS



**BETTER BUSINESS RECORDS**

## COLUMBIA EMPIRE (Cont'd from Pg. 52)

The cellulose plastics to be converted to rayon tire cord, sheets for packaging agricultural products or textiles. Two mills are now equipped to manufacture one type of rayon pulp and two more another type.

In addition 14 sulphite pulp mills, through minor changes in their operations, are potential producers of a grade of pulp which can be utilized as a chemical raw material in the manufacture of the cellulose type of plastics, rayon, acetate rayon, celluloid and cellophane. Locke predicted erection on the Pacific Coast of many large tire plants using rayon tire cord.

### 2. Hydrogenation of Oils for Soap,

Paints and Varnishes. The dizziest thing about the chemical industry is that the development of one product leads to another which might outshine the first. A third product in the electrolysis of salt for instance is hydrogen, which at the present time is largely a waste material burned under the boilers of the plants. According to Locke, a small start has already been made toward the utilization of this waste in the hydrogenation of fish oils—a major product of the area—into materials suitable for the manufacture of soap, paint, and varnish. These oils can be economically blended with vegetable oils from the Far East.

3. Calcium carbide as the basis of a Pacific Northwest synthetic chemical industry. To supply acetylene gas for shipyard welding operations, an installed capacity for making calcium carbide at the rate of approximately 130 tons a day has been accomplished. This capacity can only be continued by developing chemical plants for the preparation of derivatives of calcium carbide. At this point in the discussions the water began getting rather deep for most Portlanders.

"Acetic acid and acetic anhydride," said Locke, "prepared from acetylene are raw materials for the production of the cellulose plastics previously discussed. The combination of acetylene and chlorine might form the basis of an industry manufacturing the vinyl type of plastics or synthetic fibers."

... "Another plastic material which is considered by many to be a coming synthetic resin may be obtained by the conversion of calcium carbide to calcium cyanamide through the addition of the nitrogen of the air and thence to the resin. These melamine resins may be used in the preparation of both adhesives and molding compounds."

Locke further pointed out the great amount of phenolic resin that is shipped into the Northwest to make waterproof adhesives for plywood. If the phenol were produced in this area the less waterproof adhesives could be largely replaced and some 80,000,000 pounds per year of phenolic type adhesives produced.

4. Chemical utilization of waste timber to produce, alcohol, stock feed, charcoal and other products. More than a million tons of wood waste are burned every year in the sawmills of the region. These could and should be converted to a metallurgical grade charcoal or wood coke. Valuable tars could be recovered usable for plastics and adhesives.

A definite step in this direction has already been taken in the Springfield alcohol plant. The ethyl alcohol it produces is needed for the production of synthetic rubber. A sugar is also produced which can be utilized to grow a high protein yeast for stock feed.

The chief residue in making alcohol is lignin, about 600 pounds to the ton of dry weight wood. In its raw state it is a soil conditioner rivaling peat moss. Chemists however have used it in combination with wood fibers in making an excellent type of plastic. One Willamette Valley manufacturer is already planning to use some such a plastic in molding refrigerator cabinets. If this proves practical, a big use of steel can be adroitly side-stepped and switching the advantage away from the east coast manufacturer to the west coast producer.

5. Manufacture of sulfuric acid and superphosphate fertilizer. Sulfuric acid is

(Continued on Page 56)

# *Springs* OF ALL KINDS



**COMPRESSION SPRINGS** • California's Compression Springs are carefully controlled through all stages of manufacture from design to final inspection. They represent the ultimate in the art of precision spring manufacture. California's long experience is at your service in the solution of your war or post-war spring problems.

New Catalog available upon request



**ANY SIZE, SHAPE OR WIRE FOR EVERY INDUSTRY**

EXTENSION	TORSION	FLAT STEEL	SPRING CLIP
			

Spring Headquarters of the West since 1923

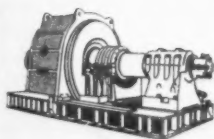
## CALIFORNIA SPRING COMPANY, INC.

1746 S. LOS ANGELES STREET  
TELEPHONE  LOS ANGELES 15, CALIF.  
RICHMOND 6221





## MAN-MADE HURRICANES



New airplanes are safer, faster and more efficient because models are first tested in wind tunnels. At the NACA laboratories at Langley Field, for instance, these new models face a 500 mile-an-hour hurricane that duplicates the terrific speed of modern flight conditions.

Power for the tremendous fan that creates this super-hurricane is supplied by a Crocker-Wheeler motor. This installation is typical of the special applications

of Crocker-Wheeler electrical equipment to perform exacting jobs in industry and commerce. Many motors and generators built by this division of Hendy have been working longer than the men who operate them, for Crocker-Wheeler has been building dependable equipment more than half a century.

Whenever your planning calls for special or standard motors and generators, let one of our field engineers give you the advantage of this long record of experience. Or if you are in need of pumps for industrial or agricultural service... or Diesel engines, steam turbines, turbo-generator plants or reduction gears... submit your problems to the nearest Hendy office.

### DIVISIONS OF JOSHUA HENDY IRON WORKS

CROCKER-WHEELER DIVISION . . . . . Electric Motors & Generators

POMONA PUMP CO. DIVISION . . . . . Vertical-Turbine & WESTCO Pumps

JOSHUA HENDY DIVISION . . . . . Steam Turbines, Diesels, Gears

ANY HENDY OFFICE IS READY TO SERVE YOU

**JOSHUA HENDY** IRON WORKS  
ESTABLISHED 1856  
SUNNYVALE, CALIFORNIA

Branch Offices: BOSTON - BUFFALO - CHICAGO - CINCINNATI - CLEVELAND - DETROIT - NEW YORK - PHILADELPHIA - PITTSBURGH - SAN FRANCISCO - ST. LOUIS - WASHINGTON - LOS ANGELES

## COLUMBIA EMPIRE (Cont'd. from Pg. 54)

one of the raw materials needed in the alcohol plant. There is only one small plant producing in the Northwest. "A 100-ton a day sulfuric acid plant in the Portland area is one of the outstanding needs of this region," said Locke.

6. *Utilization of waste sulphite liquor* from the pulp mills of the Pacific Northwest. More than one billion gallons of waste liquor is derived annually from the sulphite pulp mills. This represents one of the greatest sources of organic material already concentrated in one spot and is now a major industrial waste. The alcohol plant will make use of the sugars of this solution. They might also be utilized to

produce stock feed. The liquor can also be used to provide heat in the pulp mill.

All this does not necessarily mean that heavy industry will not be important. There were definite predictions that the postwar period would see the manufacture as well as assembly of engines of various types in the Portland area.

Gunderson Brothers are making life-rafts out of a combination of plywood and aluminum.

For the present shipbuilding continues as Portland's No. 1 industry. Its greatest problem continues to be war optimism. Within the next two weeks the Kaiser yards will embark on a supreme drive to speed up construction and delivery of their

attack transports and tankers. Lack of materials have delayed this drive up until the present time and these two types of ships now stand at the top of the navy's priority list.

Construction drives have to be carefully planned and worked out. It is futile to ask men to work faster if there is a shortage of essential material in any department.

## Geneva's Future

Although the Geneva steel plant is owned by the government, President Benjamin F. Fairless of U. S. Steel Corporation had this to say about its future while in Salt Lake City last month: "As the builders and present operators of the modern Geneva Steel Plant, we naturally are very much interested in its future. We should like, if possible, to see this plant contribute creditably to the economic growth and welfare of Utah and its neighbor States. While today the plant is Government-owned, and it is not for us to say what should be its disposition or use after the war, so much greater would be our interest if subsequent developments should make it possible for us to participate in such a constructive post-war development."

"We have no option to buy the property and no contract to lease it," he said in an interview at San Francisco. "But that does not mean we are not interested in the property." He said it would be a tight squeeze for Geneva, 800 miles inland, to lay its products down at Pacific tidewater in competition with Eastern waterborne steel, but he thought it could be done.

Geneva's fate, he indicated, depends on postwar consumption of steel in the West. The region used only 2,400,000 tons of steel before the war, while now it is using 6,700,000 tons, half of it for ship plates. But its production of finished steel products has increased to 3,500,000 tons, so unless consumption is high after the war, there will be too much production.

## Diesel Output Much Greater

Diesel engine manufacturers in the San Francisco Bay area turned out 500,000 horse power in 1943, valued at \$50,000,000—ten times the prewar volume, according to Harold Ellis, secretary of the Diesel Engine Manufacturers Association, speaking at a meeting of the diesel group in San Francisco.

The years 1942 and 1943 saw the production of more horse-power by manufacturers in this area than in all the preceding years, he reported. No reconversion problem is expected, because the same engines will be used in peace-time. Much wider use of diesel is expected in future, particularly in the marine field. One foreign government is reported negotiating for Liberty ships, in which they expect to install diesel engines as the only means of surviving competition.

# WALWORTH PIPE WRENCHES



## WALWORTH GENUINE STILLSON PIPE WRENCH:

The favorite and most widely recognized pipe wrench made. Invented by Dan Stillson in 1869, in the Boston Works of Walworth Company, and more popular with skilled mechanics now than ever before.



## WALWORTH WALCO PIPE WRENCH:

An all drop forged heavy duty wrench whose patented features insure quick, positive grip, easy release, and minimum crushing effect.



## WALWORTH PARMALEE WRENCH:

The wrench that grips like a human hand. Does not bite into or score brass or copper pipe. A necessity for any tool kit.

# WALWORTH CALIFORNIA CO.

Distributors of WALWORTH Quality Products and Allied Industrial Lines

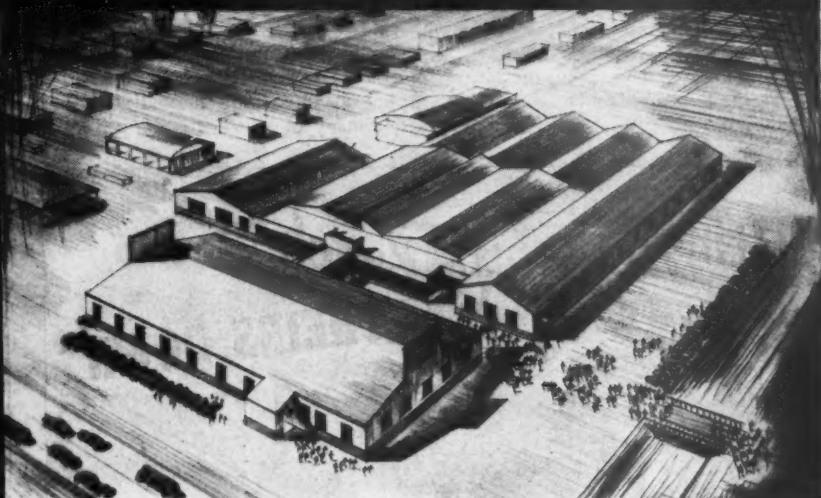
"BRING YOUR PIPING PROBLEMS TO WALWORTH"

665 SIXTH STREET • GARFIELD 3950 • SAN FRANCISCO 1, CALIF.

# DO YOU NEED A BUILDING IMMEDIATELY? HERE'S HOW TO GET THE STEEL BUILDING YOU NEED IN ONLY 55 DAYS!

## HAMMOND AIRCRAFT CO.

increased production  
40% with an Empire  
Emergency Building  
that broke an  
aviation bottleneck.



HAMMOND AIRCRAFT CO. PLANT No. 1 • BAYSHORE HIGHWAY AT SOUTH SAN FRANCISCO • SAN MATEO COUNTY, CALIF.

## A prefabricated Structural Steel Building by EMPIRE'S new Emergency Division!

If you are in an essential business you can expand now with a minimum of time and trouble.

The drawing shows how we help you solve your problem by reshaping to fit your needs certain steel buildings which we now have available.

We can furnish you a prefabricated building for re-erection anywhere on the Pacific Coast. We design and engineer the build-

ing to fit your particular problem and layout.

We are familiar with priority procedure and can help you handle these details. We will furnish cost, data, etc.



*Ready  
Now—*

The Empire Construction Co., Ltd., Engineers & Builders, 344 Harriet Street, San Francisco, has available several hundred thousand square feet of steel-frame, metal-clad buildings in separate units which can be erected on your site. Sizes are flexible and can be rearranged to suit.

Please Call Us for Further Information

## EMPIRE CONSTRUCTION CO., LTD.

*Engineers and Builders*

344 HARRIET STREET • SAN FRANCISCO 3, CALIF. • PHONE HE-3400



## In Our Mail Box

FULLEST possible development of natural resources is one recommendation on postwar planning received by *Western Industry*, while public collection of the publicly created rental of the land is another. The first viewpoint is expressed by Walter S. Johnson, president of the American Box Corporation, San Francisco, the second by Joseph S. Thompson, president of the Pacific Electric Manufacturing Co., San Francisco.

Mr. Johnson says:

"As I see it we must pursue every possible opportunity of developing the state's natural resources and utilizing the products therefrom, from the raw state to the finished product.

"This would mean that we should develop our minerals and encourage in every way the manufacturing of these into industrial items, all within the boundary of our state. As an illustration of what I am driving at be advised that our lumber industry is exporting the better grades of pine and redwood to eastern states for further manufacturing into all types of items, many of which are shipped back

into California, whereas there is no good reason why the manufacturing or refinement should not have been done right here in our own state.

"If we are to interest and support the great increase of population we are going to have to reverse the tables and not only utilize all of our raw products but also ship in from other states raw materials with which to feed our industries. We will then have finished products to ship to other states or to export.

"This all adds up to mean that we shall become a first rating industrial, as well as an agricultural, state."

### Taxation Discussed

Mr. Thompson says:

"My constant theme is the affiliation of taxation and the public collection of the publicly created rental from the land. If we could adopt this principle which had the unfortunate title of the single tax, but which is not a single tax, by a sane intelligent public revenue policy, industry freed of taxation, labor given access to land now speculatively withheld and the professional and service members of our community would prosper to a tremendous degree.

"If the western industry could work for a sane land policy, it could make the present war time stimulated activities continue through a peace time normal activity.

"Unfortunately, most of our industrialists think that their interest is concurrent with that of the land lord and land speculator and prefer to fight labor, instead of joining with labor to eradicate the constant distresses of both."

### Handling Surpluses

Two of *Western Industry's* readers have expressed disagreement with the editorial in the July issue entitled "Surpluses—Coddled, Sunk, or Dumped?"

Chas. F. Meffley of Quick Way Truck Shovel Co., Denver, writes as follows:

"I read with quite considerable interest your editorial comment. You call attention to the fact that there are three things that can be done with war surpluses, the third of which you are in favor but which is the farthest from a good economic solution.

"Dumping not only sounds drastic but is drastic. It not only demoralizes markets but ruins them. It not only injures factories but closes them. It not only hurts labor but starves it. And last but not least, it finally finds its way into the agricultural system, thereby wrecking it.

"An orderly disposition of surpluses over a period of years and a permanent stock pile of necessary reserves in critical materials of all kinds would do more to help the basic economic situation in the United States than anything we have to face after the war is won.

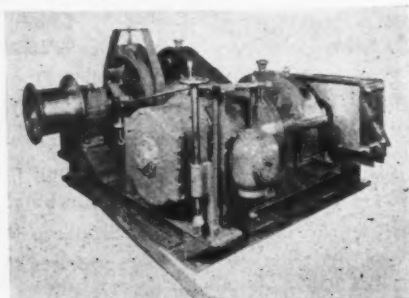
"This subject has probably been discussed more in the last few months than any other subject in America, with the exception of war. First, we have a war to win which we must do. Secondly, we must have a basically sound economic system for

**Lifting  
OURS UP TO Knock  
THEIRS DOWN**



"OFFICIAL U.S. NAVY PHOTOGRAPH"

**Hoists used on Aircraft Tenders to bring our planes up to the deck must have the ability to function perfectly at all times and under all conditions.**



**Engineering Products Co. designed and built these hoists for the U.S. Navy for use on modern Aircraft Tenders.**

On Engineering Problems call Engineering Products

**ENGINEERING PRODUCTS CO.**

1600 SO. SAN PEDRO ST. • Prospect 7044 • LOS ANGELES 15, CALIF.

industry, labor, and agriculture for these men to return to, who have been our defenders in the armed forces.

I am enclosing a copy of Senate Bill 2045 and would appreciate very much your comments on the same as I realize that there are some corrections to make on this—possibly some additions. But it is leading in the right direction."

### Payng Through the Nose

Everett A. Ryan, industrial engineer, Torrance, Calif., writes: "I am not in favor of dumping War Surpluses on the market—In the past when this was done it was sold for a song to financiers who placed it in warehouses and later sold it at high prices. We the people have paid through the nose for this stuff and we should make our wasteful government politicians get their salaries or at least part of them from the sale of this surplus. If we don't put a stop to government waste and graft it will never get any better.

"We need a curb on everything. Lumbermen, through their association, had all the government barracks burned so they could sell new lumber—as a matter of fact if it had been sold—no new markets would have felt it since it is only second grade and not suitable for many uses. A warped idea seems to be the thing now. Help us save a little sense in running affairs and not jump at someone's fool suggestion. Keep everything until a survey is made and carefully planned disposal of everything done at a future time."

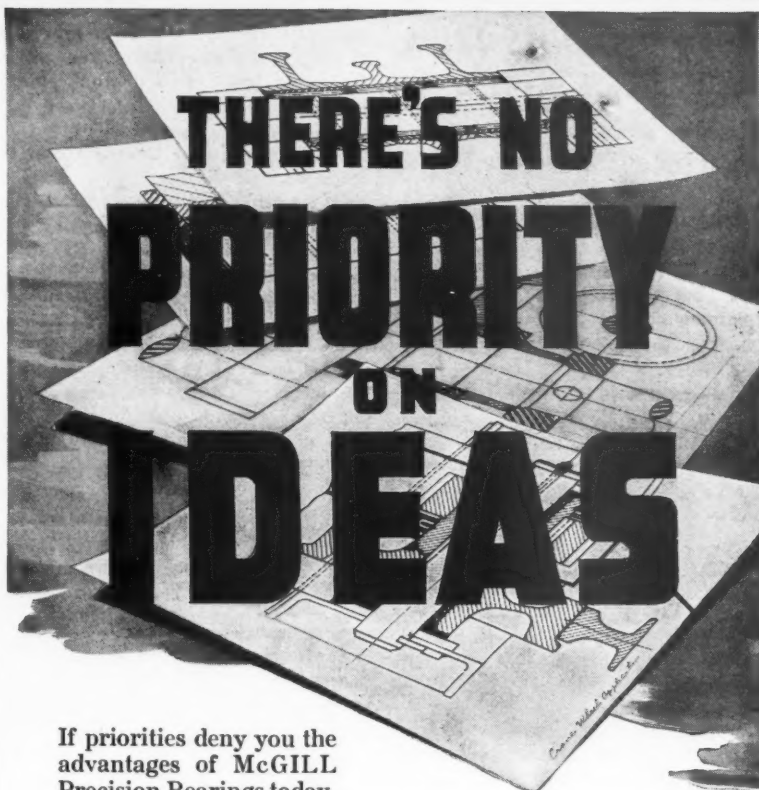
### Faster Handling by Railroads

Some examples of increased railroad efficiency were cited by W. F. Kirk, western director, division of railway transport, ODT at the June meeting of the Central Western Shippers Advisory Board at Salt Lake City. For the transcontinental railroads serving the Pacific Coast, they were:

Cars	Cars
unloaded for export in 1941, per month	18,000
April 1944	47,000
Cars set out due to congestion, March-May, 1943	159,582
Same period, 1944	1,582
Trains held out of yards one hour or more, March-May 1943, per day	27
Same period, 1944	4
Trains delayed two hours or more in terminals for power, Jan.-March 1943, daily average	72
Same period this year	11
Delay for manpower to man these trains, 1943, daily average	5
This year	3
Traffic tie-ups per day, Jan.-March 1943	20
This year	3

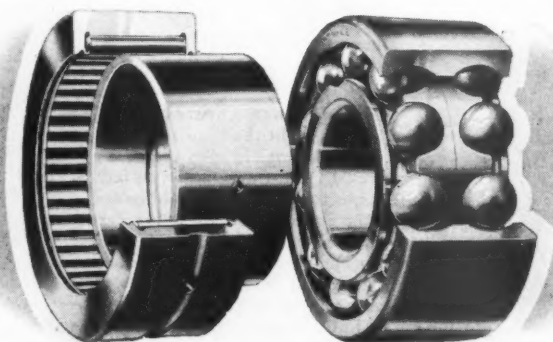
### Reopen Utah Plant

Reclamation and rehabilitation-of ordnance supplies will be carried on at the Remington Arms ammunition plant in Salt Lake City closed last fall as soon as the establishment has been reconverted to a subdepot of the Ogden Arsenal. About 600 workers will be employed.



If priorities deny you the advantages of McGILL Precision Bearings today, remember, **post-war tomorrow** is coming. The time to plan for it is now! A year from now what will we wish we had done today?

Experienced McGILL engineers are ready and eager to assist you in improving your future bearing applications. This service is yours for the asking. There is no priority on ideas. The satisfactory service record back of McGILL Ball and Roller Bearings makes their use a selling "feature" in any machine.



McGILL "Solidend" MULTIROL Bearing

McGILL Maximum Capacity Ball Bearing

Write for Catalog

### FACTORY BRANCHES:

Casey Bearing Company, 466 Golden Gate Avenue, San Francisco, California; Casey Bearing Company, Inc., 1155 South Hill St., Los Angeles 15, California; The Bearing House, 318 16th Street, Sacramento, California; R. D. Tripple, 531 Malden Avenue, Seattle, Washington; Casey Bearing Company, 372 24th Street, Oakland, California.

# McGILL

MANUFACTURING CO., INC.

BEARING DIVISION  
1575 N. Lafayette St.  
VALPARAISO, INDIANA

## EFFICIENCY KINKS FROM WESTERN PLANTS

Production short-cuts • Worker's suggestions • Prize-winning awards

**T**HE USE of coffin jacks rigged to two split clamps has provided a way in which the shrinkage gap between bronze liners and collars on certain types of marine line shafts can be completely eliminated, leaving no necessity for welding or filling after the liners have been shrunk in position.

The process was developed at the Joshua Hendy Iron Works, Sunnyvale, Calif., in preparing a number of special 5 inch four-unit propeller shafts, each set of which required three bronze liners up to 37½ inches in length. Gaps developed because the liners were put into position while expanded by heat to about ¼ inch more in length than their normal measurement when cool. Thus, gaps, of from ⅛ inch to 1/8 inch were left between the liners and their collars, since shrinkage was from both ends to the middle.

The first step in solving the problem was the construction of a vertical hot-air oven for the controlled heating of the liners and collars, a method already in use for the much larger tailshafts required in much

more powerful vessels. But whereas the tailshafts are dropped into the heated liners, a different system had to be adopted to enable handling that would prevent gaps.

While the liner, with the collar set on top of it, is heating in the vertical oven that reaches 16 feet below the floor level, the shaft is set up vertically on its flange on the floor of the oven pit. At the end of an hour, the 3 inch collar is removed and slipped into place on the cold shaft. The male joint of the collar (which corresponds with the counterbored female joint of the liner) fits flush against the shaft and faces upward. To hasten the cooling of the collar, it is sprayed with a ring-like shower device, one of whose semi-circular arms has a flexible hinge to permit quick adjustment around the shaft.

When the collar is permanently frozen into place the really speedy work is ready to begin. Over the top of the tubular liner, still in the oven, is slipped a specially designed cam-action clamp, lifting of which by its two ring-end arms presses slip-proof jaws against the liner.

Hoisted by crane, the liner is quickly lowered over the shaft. When it is almost in the proper position, two fixed wings on the clamp rest on transverse beams, the weight of the arms releases the jaws, and the liner drops into place.

Split-second timing is necessary from now on, for shrinking is so rapid that not

more than half a minute remains for the rest of the job. Two workmen apply steel split clamps just above and below the liner, hook them together with the link chains of two coffin jacks, one on each side, and apply pressure by working the jack handles.

The circular spray is applied to the bottom of the liner and moved slowly upward, while the pressure from the frequently tightened jacks keeps the liner tight against the collar joint so that effective vertical contraction can take place only in one direction. An hour and 15 minutes after the liner has been placed in the oven, the lined shaft is complete and ready to be machined except for a brief period of cooling.

To shorten the time and spoilage in shrinkage bronze surface liners on the tail section of marine lineshafts, and to achieve precision engineers at the Joshua Hendy Iron Works at Sunnyvale, California, devised a heating chamber of original design.

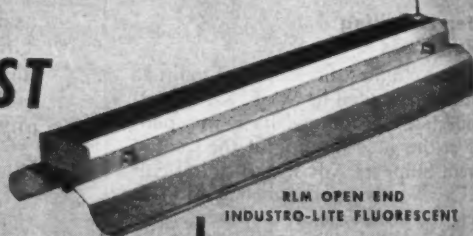
The tubular liners are 12 feet 8⅞ inches long, 19 15/16 inches in outside diameter, and 1 1/32 inches thick, cost around \$2500 each, and cannot be salvaged if they have been improperly set on the shaft.

Under the method generally in use, the tubular liner is heated with torches until it has expanded to an adequate point. The cold shaft is then slipped inside it and the liner is permitted to shrink into position. This process usually takes from four to six hours, and frequently, after the shaft

## MADE IN THE WEST

RLM STANDARD DOME REFLECTOR

Smoot-Holman fixtures are made almost in their entirety in the large Smoot-Holman plant at Inglewood, California. Only a very few highly specialized parts are obtained from other sources and these are carefully tested and certified to be of highest quality. Our complete control of production, extending through each department of the plant, assures a quality supply available to western buyers of lighting fixtures. Our location, with branches and warehouses at strategic western points assures a dependable supply.



RLM OPEN END INDUSTRIO-LITE FLUORESCENT

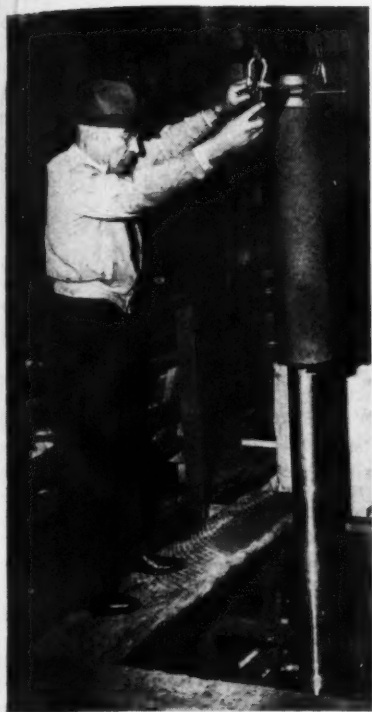


LUMAX LUMINAIRE



OFFICES IN PRINCIPAL WESTERN CITIES • BRANCH AND WAREHOUSE IN SAN FRANCISCO





• Held by special cam-action clamp with automatic release, the heated bronze liner is lifted from hot-air oven (rear) and slipped over propeller shaft, set up in 16-foot pit. When fixed wings of clamp strike parallel transverse beams, arms drop, liner is released and drops into position on steel collar, which has been shrunk to shaft.

has been inserted, cooling is uneven or too rapid, with the result that the liner freezes in the wrong position on the shaft and must be removed by cutting—an additional expenditure of time as well as a loss of valuable material.

In comparison, the Hendy process takes only from 1½ to 1¾ hours from start to finish, and freezing of the liner in its proper position is assured.

The vertical heating chamber, constructed to accommodate the entire 19-foot 4½-inch length of the shaft, exclusive of the flange, was constructed down from the floor level. It is metal-lined and insulated.

When the bronze liner has been put in position in the chamber and checked for accuracy of placement, two electric air furnaces go into operation. One, at the bottom of the chamber, heats the outside of the liner. The other, moving on tracks at the floor level, connects with the chamber by means of a tight cap and directs superheated air to the inside of the cylinder.

Thus, perfect uniformity of heat is assured. Three thermometers report on temperatures at the bottom, center, and top of the chamber.

When two set micrometers at the top of the liner show that it has expanded sufficiently, the upper furnace is disconnected and rolled away on its tracks, while the

(Cont'd on Page 62)



## There's a difference in Production...when Washrooms are Sanitary



A survey\* of more than 1,600 leading manufacturers has shown a program of Health, Safety and Sanitation has accomplished the reduction of occupational disease 62.8%! Yet the average cost of the health program (including medical services and nursing, machine safety, personal hygiene and plant maintenance) was less than ½ of 1% of the company payrolls.

Personal Hygiene, Plant Sanitation and Maintenance is West's part of the program. Without it, a health program has little chance of success.

\*Based on a survey by the National Association of Manufacturers

**West Automatic Drip Machines** are designed to meet the need of proper washroom deodorization in a simple, economical and efficient method. They are placed above toilets and urinals so that an aromatic liquid constantly drops into the bowl, tending to overcome washroom odors at the source.

**West Bowl Cleaner Service** is a primary requisite to all sanitation programs. West has organized an "army" of trained service men to operate from its branches from coast to coast. They are experienced in using the proper products in the most efficient manner and on a periodic schedule. Thus management may relieve their maintenance crews of this necessary duty and be assured that it will be efficiently and regularly taken care of.

• Send for free literature

# WEST

DISINFECTING  
Company



42-16 WEST STREET, LONG ISLAND CITY, NEW YORK

DEPT. WI

## EFFICIENCY KINKS (Cont'd from Pg. 61)

lower furnace continues to heat the outside surface, keeping the expansion of the tube at a constant point. The cold shaft, equipped with a special spacer to insure correct position of the liner, is then lowered into place, and the lower furnace is turned off.

Since the installation has permitted perfect control of temperatures, the liner has been expanded to the minimum necessary for the easy insertion of the shaft, and the shrinking process is quick and uniform, with no chance for distortion or premature freezing. All handling is done by crane, with special clamps to hold the liner and shaft, thus adding a special safety factor not present in previous methods.

### Removable Tip For Router Pilot

Cutting sheet metal with a router involves feeding the material to the router bit, which is a revolving cutter. The pilot, which consists of a cylindrical steel element located in the table, is used as a guide for the cutting block. This pilot has always been an extension of a barrel which is locked in the table of the machine. Whenever the pilot was damaged it was necessary to remove the whole barrel. This was a difficult task and resulted in frequent damage to both tools and pilots.

The idea presented by Willard Harpster of the sheet metal department of Ryan

Aeronautical Company, San Diego, to overcome this drawback has proved to be very effective.

Instead of a one piece pilot, it is made with a removable tip. This tip is held in the barrel by an Allen set screw. The pilot tips are made to fit all standard and re-sharpened router bits. They have a shank of .375" diameter and fit into a barrel with an opening of .3755" diameter. One side of the shank is flattened slightly in order to make it easier to remove. This is to accommodate the burr, caused by the set screw, which otherwise would bind the shank. The pilot ejector may be tapped from below for quick removal.

### Historians Unearth First Prize Idea

It was a very hot day, and Hodcarrier Hennessey was resting in the shade for a moment. Hennessey was the beginning of a long line of hodcarriers, for he lived in Babylonia several thousand years B.C. He had good reason to be tired—they used big bricks in those days.

So Hennessey was sitting there, having a short barley beer and muttering over his plight. "Ain't this a helluva note—lugging those blocks for a leaderman that don't know which way is up! Now if I only had a little two-wheeled cart, this job would be duck soup. Only trouble is nobody has invented the wheel yet."

Next day Hennessey turned in his in-

vention, the wheel, to the Babylonian labor-management committee. Later, Hennessey worked out another gadget—a method of lifting heavy blocks by means of a long shaft which he called a "lever." The last history heard of him, Hennessey had become a supervisor and had stopped thinking.—*Fore'n'Art* (Richmond Shipyards)

### Iron and Bauxite Deposits in Oregon

Recent investigations by the Oregon department of geology and mineral industries have disclosed sizable deposits of high alumina iron ore or high iron bauxite over a considerable area in northern Washington county.

The occurrences are in separate deposits, five to 15 feet thick, usually overlain by several feet of silty soil. Surface mining methods probably would be applicable in all deposits so far examined, the investigators said.

Chemical analyses indicate that the ore will average 20 to 25 per cent iron, 25 to 35 per cent alumina, 6 to 12 per cent silica and .15 per cent phosphorus.

The department said there are no commercial operations treating this type of ore in the United States but similar material in Norway has been successfully reduced in electric furnaces on a commercial scale to produce a high-grade pig iron and a calcium aluminate slag. The slag is further treated chemically to produce alumina.

## HOOKS THAT REALLY TAKE Care OF THE LOAD

**HORIZONTAL PLATE HOOKS** may be used in sets of either two or four. Will handle one or more plates at each lift. They are time and labor savers for fast loading or unloading when plates are to be stacked in the flat position.

**DOWNS RAIL TONGS** built for safe and economical handling of railroad rails of all sizes and weights. Two-ton capacity with jaw openings of 3" for rails up to 100 lbs. ASCE. Three-ton capacity with jaw openings of 4 1/2" for the heaviest rails.

**SAFETY PLATE GRIPS** with either rigid or loose guide loops will hold with a positive grip in all positions. Used for handling vertical plates, they are also safe for upending or turning over horizontal plates or assemblies. Write for illustrated catalog.

**DOWNS CRANE & HOIST CO.**  
MECHANICAL ENGINEERS  
340 W. Vernon Ave., Los Angeles 37, Calif.

## Keep Their Busy Hands Safe



## in New Lightweight STANZOILS

with revolutionary new non-slip finish

Especially for light assembly and inspection work, these new lightweight but durable neoprene Stanzoils provide comfortable hand protection with unusual finger-tip sensitivity. This and a unique non-slip finish that grips more firmly than bare fingers, encourage speed and accuracy. Stanzoils of neoprene resist damage from oils, acids, caustics, safer hands—saving you lost production, costly disability claims. Write for complete data on Stanzoil RSW-13.

Not all synthetic gloves are oil resistant!



Synthetic Rubber Division  
**THE PIONEER RUBBER COMPANY**  
267 Tiffin Rd., Willard, Ohio, U.S.A.  
New York • Los Angeles

MADE WITH DU PONT NEOPRENE

## Ready Reference On Union Contracts

Statistical analysis of the contents of labor agreements, comparison of groups of contracts and of sample clauses has been made available through an indexing system which tabulates the outstanding provisions of union contracts devised by the Industrial Relations Section of the California Institute of Technology.

Each current contract is analyzed, classified, and its clauses are coded on a punched card. These punched cards, each of which is coded to correspond to a single agreement, may be mechanically sorted.

The wealth of information about contracts which this systematic analysis will make available is expected to be useful to unions and companies negotiating a contract.

This contract index is one of the first attempts to assemble and maintain information on the detailed provisions of a large number of agreements. Specific clauses such as seniority, holidays, and overtime pay, have been classified on the basis of their characteristics and are coded according to type. In some cases it has not been practical to identify different types of clauses and the index merely shows the presence of a clause governing such provisions as rotation of shifts, union-management cooperation, or sick pay benefits.

At first, the contract index will provide only information on current practices in writing contracts; over a period of time, it will reflect changes and trends in the various provisions.

## Kaiser Takes On Gypsum Deal

Henry J. Kaiser Co. has made a partnership agreement with Standard Gypsum Co. of California to lease, develop and expand plants and market for gypsum products with certain private financing. Kaiser and Samuel A. Perkins, president of Standard Gypsum, owning properties estimated by Mr. Perkins at "approximately \$20 million," state the arrangement is without Government aid.

The partnership will keep the name of Standard Gypsum Co. but will be re-incorporated in Delaware, succeeding the California corporation.

## G-E at San Jose

General Electric Company is making plans for establishing a modern manufacturing plant immediately south of the San Jose city limits, west on Highway 101 after the war, 57 acres of land having been purchased. G-E California plants include the Oakland lamp factory; the Oakland works which produces magnet wire, transformers, electric cable and motors; the Ontario works in Southern California, and service shops located in San Francisco and Los Angeles, with a new shop scheduled to open soon in San Diego.

# War Industries Plus WAR EFFORT



Before hostilities, America had the resources in field and laboratory to match anything our enemies could offer. But it took war itself to prove how overpowering our concerted, patriotic national *war effort* could be. In the vanguard of successes built of mind and sweat and spirit has been American Industry. However great or small your part has been in building and producing for war, your *extra effort* has earned you the title, Citizen Soldier.

## WE ARE ON THE JOB, TOO

At Associated, we are intensely proud to serve industry-at-war by increasing our production of fuels and lubricants, stride for stride with you in the race for Victory. And, with you, we are planning an even bigger and better job in the peace-world to come. Meanwhile, don't decide you have the best available solution to your wartime lubrication problems, not until your Associated representative shows you how we have improved performance and protection through newly developed petroleum products. Seek his advice and assistance any time, without obligation.



GASOLINE POWERS THE ATTACK  
—DON'T WASTE A DROP!



## TIDE WATER ASSOCIATED OIL COMPANY

CADEL A. P. (ALL PURPOSE) HEAVY DUTY LUBRICANT • VEEDOL AND  
TYDOL MOTOR OILS • CYCOL INDUSTRIAL LUBRICANTS • ASSOCIATED  
AVIATION ETHYL AND FLYING A GASOLINES  
FISK TIRES • AERO BATTERIES

LISTEN TO ASSOCIATED FOOTBALL SPORTCASTS



# Industry in Review . . . Tehachepi to Tijuana

**R**ECENT reports that a large tract of land near the Kaiser steel mill at Fontana has been purchased by the Ford Motor Company, and that the Willys-Overland interests who have the manufacture of the jeep under their wing have bought a controlling interest in one of the largest and most successful war plants in the Glendale-Burbank area, may be either wartime fiction or post-war fact. Time will tell which is the case. It may simmer down eventually merely to the West having more automobile assembly plants than before the war. Nevertheless these reports serve to confirm the conviction of many observers that the rise of Southern California metropolitan area to fifth place in manufacturing leaderships in the country is not entirely a war-time phenomenon.

Many manufacturers have come out from the East to choose good locations for branch factories after the war. One of the most recent of these is the Universal Sanitary Manufacturing Company, makers of vitreous china plumbing fixtures, who have just purchased 212 acres of land at Men-

tone for a future factory where they expect to employ 250 workers. Mentone is a hamlet on the outskirts of Redlands, which is the easternmost city in the orange belt extending eastward from Los Angeles, and about 20 miles beyond Fontana.

**Lower Costs**—A growing population and a good working climate are two of the drawing cards. But a third card that some plants hold is low operating costs. Some good authorities have informed *Western Industry* that when tanks were built at the General Motors assembly plant in Los Angeles in 1942 and early 1943, costs in the foundries and some of the other participating sub-contractors were substantially below the showing subsequently made in the Cadillac factory in Michigan after the tank contracts were transferred back there.

A branch of an Eastern metal fabricating concern is getting the same volume of production out of its Southern California plant as the home factory with a smaller labor force, due partly to more efficient plant layout, and equipment, to be sure, but

also to more intelligent labor. Similar instances are not lacking with other companies.

Some hard-boiled Eastern executives have inclined to the view that the pleasant surroundings of factories in this area and the absence of the traditional smoke, grimy buildings, dismal neighborhoods and hot interiors is incompatible with real production. One observer said the employees in the Southern California tire factories sauntered, whereas in Akron they ran. But to all this another remarked that when workmen are pushing things around with their shoulders and backs they haven't much time left for more intelligent operations.

**Local Plans**—But eastern-owned factories are not the only ones with post-war ideas. What some of the local people have up their sleeves would make highly interesting reading, if we dared to tell it.

One of the most substantial industries in Southern California before the war was oil well supply. Manufacturers of pump casings and other supplies did a big volume of business, not only in the Long Beach, Ventura, and Bakersfield areas of their own state but also in the more distant fields of Oklahoma and Texas. They are looking forward to plenty of domestic activity after the war, plus a big stake in rehabilitation of the oil industry of the East Indies when the Japanese have either



## WHY USE WASTEFUL "BUCKET BRIGADE" METHODS

Today speed is paramount! Outmoded is the old wasteful "bucket-brigade" method of handling the cases in your plant and on to your delivery trucks.

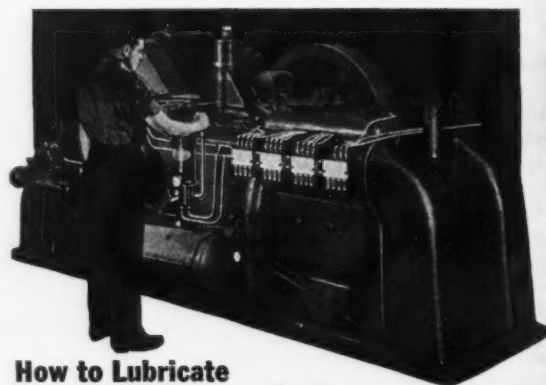
A Stevedore, Jr. will supply you with the hands of ten ordinary men. Like a giant's hand it takes the "grunt" and fatigue out of lifting.

Quick-acting "Cam-lock" Portable Standards provide a range of adjustment to meet varied operating conditions . . . from 18" level to 74" delivery height. Stevedore, Jr. plugs in on a standard 110 volt lighting circuit and lifts a 225 pound distributed load at the rate of 50' per minute.

Send for complete information about this new labor saver. The Rapids-Standard Company, Inc., 5352 Bond Avenue, N. W., Grand Rapids 2, Michigan.

**WEST COAST DISTRIBUTORS:** E. C. Buehrer Co., 562 Bryant St., San Francisco, Calif. M. E. Canfield Co., 420 E. 3rd St., Los Angeles, Calif. Murry Jacobs Co., 528 1st Ave., So., Seattle, Wash. Oregon Handling Equipment Co., 907 Terminal Sales Bldg., Portland, Ore. Murray Brokerage Co., Wazoo Market, Denver, Colo.

## POWER BOOSTER



## How to Lubricate All of Your Bearings At Once —

In less than 1 minute! Instead of taking one minute for each bearing, your oiler can lubricate all bearings in a half a minute—from one safe, central point.

By maintaining a continuous film without waste of lubricant, the Farval Centralized System eliminates shutdowns to lubricate or to replace bearings—reduces power consumption by as much as 20%—and prolongs bearing life from 5 to 25 times.

Farval men will plan the correct Systems for your equipment. Write today—or wire.

**THE FARVAL CORPORATION**  
3269 E. 80th Street, Cleveland 4, Ohio  
San Francisco • Los Angeles • Portland • Seattle



## FARVAL

CENTRALIZED  
SYSTEMS OF  
LUBRICATION

thrown up the sponge or have been figuratively blotted out.

This activity is expected to take up a great deal of the slack with the foundries when shipyard sub-contracts slack off. It should also be borne in mind that the United States will undoubtedly keep such a large fleet in the Pacific for a long time that the business of supplying it will remain an important industry in itself.

**Trend to larger plants**—Some interesting figures were furnished to Maury Maverick of the Smaller War Plants Corporation on his recent barnstorming trip to the West Coast by E. F. Scattergood of the Los Angeles Bureau of Power and Light. These were that in January, 1942, 300 larger plants consumed 60 per cent of the total electric power supply of the Bureau (i.e., from Owens River and Boulder Dam), while 4,825 smaller plants used the remaining 40 per cent. In April, 1944, the number of large plants had increased to

438, consuming 76 per cent of the power load.

#### Mining Increases Under Scrutiny

Reports of unauthorized wage increases at mines in the Great Falls, Montana, district, are being investigated by the War Labor Board and the Nonferrous Metals Commission.

The wage bracket for miners in the Montana mines, except for Butte and Anaconda, is \$7.00 a day and for muckers and surface workers \$6.50 a day. Because of difficult mining conditions, a slightly higher pay is allowed at Butte.

Most of the complaints of alleged violations of the wage stabilization program center around the Neihart section, where there have been reports of operators offering higher rates of pay and inducing workers, engaged in essential war production, to leave mines.

## TENITE an EASTMAN PLASTIC

### ☆ Headquarters for Ideas ☆ ON THE USE OF PLASTICS

For war needs now and for planning postwar products ... send for illustrated booklet describing Tenite applications and properties.

**WILSON & GEO. MEYER & CO.**  
LOS ANGELES      SAN FRANCISCO      SEATTLE

## Controlled Rubber MANUFACTURED TO YOUR SPECIFICATIONS



Multiple extrusion of rubber for increased production is one of the many new techniques developed to meet the exacting demands of war, and will later be available for commercial products. Inquiries concerning any of your present or future rubber problems and developments are invited.

*Los Angeles*  
**STANDARD**  
*Rubber, Inc.*

1500 East Gage Avenue, Los Angeles 1, California

*Johnston*

## STAINLESS STEEL WELDING RODS

**ARIZONA  
WELDING EQUIPMENT CO.**  
230 S. CENTRAL AVENUE  
PHOENIX, ARIZONA

*A.P. Johnston*

1845 EAST 57th ST. LOS ANGELES, CALIF.  
TELEPHONE KIMBALL 2508



### FOR SAVINGS AND CHECKING ACCOUNTS

For the convenience of your business or household—a Mailway checking account. For safe and systematic accumulation of a cash reserve—a Mailway savings account. Both are available to you, affording quick reliable service from one of the oldest and strongest banks in the West. Open a Mailway account today.

*Full details on request*

**CROCKER FIRST  
NATIONAL BANK**  
OF SAN FRANCISCO  
*California's Oldest National Bank*

Member Federal Deposit Insurance Corporation  
ONE MONTGOMERY STREET

# LABOR

## AND THE INDUSTRIAL WEST

### Southern California Differential Denied

The entire Pacific Coast is not a single labor market, and the payment of a differential in Northern California, Oregon, and Washington for ship repair and conversion jobs over new ship construction does not create an inequity in Southern California, said Dexter M. Keezer of the National War Labor Board, in a decision denying an 11.6 per cent differential at two San Pedro yards, Bethlehem and L. A. Shipbuilding and Drydock.

"In addition, operation of the repair differential in Northern California since 1942 has created conditions that interfere with the fully effective prosecution of the war program as demonstrated by recent difficulties in the San Francisco area," Keezer said procurement officials declared during the hearings.

The board's action upheld its Shipbuild-

ing Commission. This commission also ordered a standard maintenance of membership clause with a 15-day escape period in an agreement between the Wilson Company of Wilmington and the Los Angeles Metal Trade Council, AFL. The union sought a closed shop agreement, contending that the standard maintenance of membership clause is a form of open shop.

### Two-Shift Basis At Calship

To meet a Maritime Commission demand for increased production of transports, California Shipbuilding Corporation changed from a three-shift to a two-shift day on August 21, thus stepping up production 17½ per cent and enabling the yard to turn out approximately four extra ships before a specified deadline. The full order is for 30 transports.

Under the new arrangement Calship workers on both the day and swing shifts

will work nine full hours each shift, six days a week, with 54 hours of actual work each week, or 61 pay hours per week for day shift workers and 65½ pay hours per week for swing shift workers.

Weekly pay checks under old and under new working arrangements are as follows:

		Old	New
Helper	Day	\$49.40	\$57.90
	Swing	54.34	68.43
Journeyman	Day	62.40	73.20
	Swing	68.64	86.46

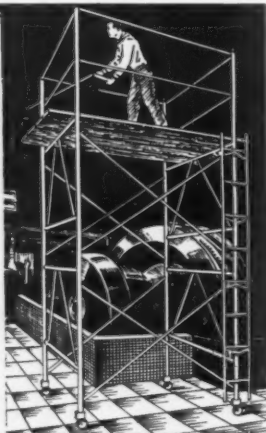
With 15,500 workers, a serious additional parking problem is involved and an appropriation of \$127,000 has been obtained to provide 1400 additional parking spaces.

### New Deal Fosters Labor Unions

Influence on union organization of the National Recovery Act of 1933 and the National Labor Relations of 1935 is evidenced in a report "Union Labor in California, 1943," issued by John F. Dalton, state labor commissioner. Data on the number of members classified according to year in which the locals were chartered shows that the membership of locals organized in the period 1930-39 constituted 47 per cent of the total number of members reported by all unions which replied to the questionnaire.

Locals organized in the war-boom years 1940-43 included 7 per cent of total re-

**EVERY PLANT**  
should have a  
**BEATTY-SAFWAY**  
MAINTENANCE  
**TOWER**  
always available  
**TO SAVE**  
**TIME AND**  
**ACCIDENTS**



This 15 ft. rolling tower set up in 10 minutes

**BEATTY**  
**SAFWAY**  
*Steel*  
**SCAFFOLD**

**SOLD OR RENTED**  
by the Beatty-Safway  
Distributor in your Territory

**SCAFFOLD**  
**FOR**  
**EVERY**  
**PURPOSE**

Manufactured by  
**BEATTY STEEL**  
**PRODUCTS CO.**  
415-421 BRYANT STREET  
SAN FRANCISCO



**FAST — EASY**  
**ECONOMICAL — SAFE**



In all types of industry—production, maintenance or service—Punch-Lok Banding Method is at work... connecting hose, stopping leaks in steam or water lines, splicing electric cable, reinforcing and mending splits in cross-arms, poles and ladder rails, tying rigid conduit or flexible cable to pipe lines or girders, seizing ends of wire or manila rope to prevent fraying... in short, wherever a banding method can be used to connect, mend, splice or reinforce. Open end bands available for use when ends of work are obstructed. There are places in your industry where Punch-Lok Clamps would save you time and money.

★ Write for Descriptive Catalog and Name of Local Distributor



**PUNCH-LOK COMPANY**

Pacific Coast Representative:  
H. M. THOMAS, Dept. B, 1554 Oakland Ave., Piedmont 11, Calif.

**Clamp — Splice — Tie**  
**Mend — Reinforce**  
with  
**PUNCH-LOK**  
*Streamlined*  
**BANDING METHOD**



**CLAMPS**... Made of flat, high tensile galvanized steel or of Everdur, which is a corrosion resistant copper base alloy. All clamps are double wrapped. Available from ¾" to 48" I.D. Any larger size clamp can be pulled down to fit any smaller diameter.

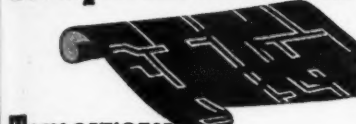
**LOOKING TOOL**... Sturdily constructed to assure long life. Locks all size clamps with a sufficient tensional pull.

**GROOVED FITTINGS** For hose lines—air, water, steam or any other fluids. Permits application of high pressure clamping without damage to hose.





## Today..WAR WEAPONS



## Tomorrow... Payne

### ZONE-CONDITIONING

There's only one important job now . . . backing up the armed forces. We've been concentrating on it for more than two years. But after victory, our dealers will have a new "sales weapon": PAYNE Zone-Conditioning, post-war successor to old-fashioned central heating. ★ Meanwhile, let's all buy more, and more, War Bonds.

#### REQUEST NEW ZONE-CONDITIONING FOLDER

... just published for the information of families who plan to build or remodel. Write for sample copy.

COPYRIGHT 1944—PAYNE  
FURNACE & SUPPLY CO., INC.

## PAYNEHEAT

30 YEARS OF LEADERSHIP



Payne FURNACE & SUPPLY CO., INC.  
BEVERLY HILLS, CALIFORNIA

ported union membership. Unions chartered in the 10-year period, 1920-29 had only 6 per cent of the members compared with 15 per cent for the 1910-19 decade.

The number of women union members in reporting locals increased by 120 per cent between 1940 and 1943. Women constituted 17 per cent of the total membership of all reporting unions in the state in 1943, compared with 10 per cent in 1942. Many unions which had no women members before the war have admitted them to their rolls in recent years. In 1940, only 25 per cent of the locals which replied to the annual questionnaire had women members; in 1943, 44 per cent of the identical reporting unions had women members.

Membership in California labor unions has more than doubled in the war period.

### From Tide Water To GI Joe

Tide Water Associated Oil Company's military service policy has been amended to provide that every one of its employees on company leave of absence in the armed services shall receive as a special allowance toward his expenses incidental to entering military service the sum of \$200 if married and \$100 if unmarried. This is subject to tax deductions required by law.

An additional amendment, subject to stockholder approval, provides that on re-entering the company's service and continuing therein until retired, he shall be granted service credit equal to double the period of his military leave of absence in the calculation of any retirement allowance for which he may be eligible.

Further, the actual compensation from the company and which is one of the factors on which his retirement allowance is based, will be assumed to be greater by double the amount which the employee would have earned during the period of his leave of absence for military service at the base rate of pay in effect when he entered the armed service.

Previously the company canceled indebtedness from employees and customers in the service for petroleum products purchased through courtesy credit cards, presented employees with \$150 in war bonds, considers the period of their military service as continuous employment, pays a year's premium on their government life insurance, and if they have not enjoyed a vacation in their induction year compensates them to make up for it.

### Cannery Wages

The first night-shift differential in the canning industry in the country has been granted by the 12th Regional WLB at Seattle in a decision affecting all cannery workers in the Puget Sound area. The differential of 2½¢ will apply only to straight time hours worked between 8 p.m. and 6 a.m. A wage increase of 4½¢ an hour in base contract rates will bring the base rates to 85¢ an hour for men and approximately 71¢ for women.



## Speed-up the work!

*Be sure your equipment  
is in tip-top shape*

You may have as much as 10-20 per cent more output (and profit) in your present set-up if every tool is in good shape. Let us make an examination of your welding equipment—give you an impartial report that tells what should be repaired and what it will cost. No charge or obligation—just part of the service that has helped make us the largest California-owned manufacturer of Oxygen and other gases.

We're also one of the largest distributors of welding equipment and supplies. Stocks in more than fifty towns. Service that makes you say, "good outfit!" Just telephone, and we'll get on the job—fast.

## Stuart Oxygen Co.

San Francisco, Oakland, Los Angeles

*In the most vital war work on the Pacific Coast... where uninterrupted production is a "must"... every foot of Acetylene that is used by six of the largest shipyards is generated from*

## PACIFIC CARBIDE

Made by Pacific Carbide & Alloys Co., Portland, Oregon.

Distributed and unconditionally guaranteed by Stuart Oxygen Co.

# THE WESTERN OUTLOOK... NEWS... STATISTICS

## THE PICTURE

The labor shortage has at last begun to affect shipyard production, and unofficial estimates indicate that the equivalent of three deliveries of ships in July was lost for lack of manpower. The manpower situation is temporarily most critical, however, in production of heavy truck tires. Aircraft output remains steady, but a drop in electric power production has appeared, due probably in part to the cutbacks in the aluminum and magnesium programs, these two industries being heavy users of power. No new figures on war production contracts were received this month.

## Lumber—Rationing Starts

The weekly average of West Coast lumber production in July (4 weeks) was 130,322,000 board feet, or 82.5 per cent of 1940-1943 average. The industry has to date kept a lead in production of about 5 per cent over the corresponding months of 1943, but this lead is now in danger of being lost because of shortage of men and equipment. Most serious is the shortage of logging truck tires, which may cause curtailment of lumber production in the next 60 to 90 days unless the urgent tire needs of loggers are meanwhile met.

There is no letup in war demand for lumber. Military agencies are taking over 50 per cent of West Coast production, and since July 31 the remainder has been under the very drastic control of the new WPB Order L-355, which puts lumber under a rationing system and stops a certain amount of leakage.

Military lumber demand continues to present two main requirements—box and crating, and beachhead construction. Rising tempo of the war in the Pacific is steadily increasing the lumber needs of that area, while the requirements for transatlantic lumber shipments do not diminish.

Cumulative figures for 30 weeks in 1944 and previous years in thousands of board feet reported by the West Coast Lumbermen's Association are as follows:

	1942	1943	1944
Production	5,084,383	4,427,851	4,642,756
Orders	6,256,201	4,774,626	4,873,825
Shipments	5,630,685	4,556,333	4,687,569

Western Pine Association figures covering Idaho White pine, Ponderosa pine, Sugar pine and associated species for the current year to July 29 are as follows:

	1943	1944
Orders	2,505,680	2,242,337
Shipments	2,258,064	1,162,269
Production	1,970,174	1,975,269

## Copper—Continues Off

Copper production (in terms of recoverable metal) from domestic mines (including Alaska) was 83,850 short tons in June, a decrease of 3,934 tons (4 per cent) from that in May, according to preliminary estimates of the Bureau of Mines, United States Department of the Interior. The average daily production in June was 2,795 tons, a decrease of 37 tons from the average daily production of 2,832 tons for May.

The production of the combined Western states decreased 3,691 short tons (5 per cent) from the May output due largely to a lower output from the three largest copper-producing states: Arizona, Utah, and Montana. The largest decrease (2,082 tons) was noted in the output from Arizona, which reported its lowest copper output of the year. Labor shortages and adverse weather conditions were largely responsible for the decline. The drop in the production from Utah and Montana was due almost entirely to

an insufficient labor supply at the Utah Copper Co. and the Anaconda Copper Mining Co. respectively.

Production figures from the Western states in short tons, are as follows:

	Ariz.	Mont.	Utah	Tot. Western including other states
Jan.-March	102,224	35,421	79,046	255,621
April	33,967	10,683	24,545	69,195
May	33,832	10,668	24,979	69,479
June (prelim.)	31,750	8,900	23,400	64,050

## Ships—Sharp Sag Appears

Previous reports of stabilization being reached in West Coast shipbuilding have failed to hold up. July deliveries were only 38 ocean going cargo ships, 398,700 deadweight tons total, a drop of 17 ships from June. For the first time labor shortage appears as a cause. Figuring this drop of 17 ships on a basis of uniform units of production, unofficial estimates are five vessels lost in July on account of change from Liberty ships to Victories, two due to some yards tapping off of production and going into other types of government work, leaving four lost on account of lack of manpower. In July there were 39 keels laid and 38 launchings, and three tug delivered and two launched.

	No. of ships	Thousands of deadweight tons
January, 1944	67	633
February	59	585
March	73	679
April	64	641
May	72	693
June	55	516
July	17	399

(Includes destroyer escorts and small aircraft carriers, but not larger naval vessels built by the navy itself. Also includes concrete barges, but not tug boats or wooden barges. Tonnage figures from September 6 are adjusted, previous months unadjusted. Deadweight tons are used as a rough measure of the cargo carrying capacity of the ship. All figures from U. S. Maritime Commission statistical department.)

## War Production Contracts—Flock of Cancellations in May

In Thousands of Dollars—Source: War Production Board Statistical Division

NOTE: The monthly award figures shown below represent only an approximation of the actual contracts, because cut-backs and cancellation are usually on previous awards, although reported in the current month. Also there is considerable lag in the reporting of individual contracts. However, WESTERN INDUSTRY is reporting the monthly awards by the successive subtraction method as an approximation.

	MONTANA	IDAHO	WYOMING	COLORADO	N. MEX.	ARIZONA	UTAH	NEVADA
	All Other	Ships All Other	All Other	Aircraft Ships	All Other	Aircraft Ships	All Other	All Other
January	...	370	1,280	...	125,636	824	112	66
February	1,384	52	7,858	...	374	...	208	175
March	34	50	602	98	119	3,069	573	9,396
April	...	29	13,000	...	520	1,506	...	653
May	53	121	12,638	250	...	6,022	161	300
Total from June, 1940	15,807	721	8,315	30,580	1,714	2,706	398,755	4,761
							48,295	387
							23,928	900
							169,227	...
							24,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	...
							2,800,000	

## Electric Energy—18 Per Cent Decline in June

Production of Electric Energy for Public Use—In thousands of Kilowatt Hours—Source: Federal Power Commission

	Montana	Idaho	Wyoming	Colorado	New Mexico	Arizona	Utah	Nevada	Total Wtn.	Washington	Oregon	California	Total Pac.
May	205,605	122,700	26,558	81,677	38,266	265,685	47,694	269,325	1,053,010	698,471	389,494	1,239,465	2,327,000
June	201,687	115,247	29,316	78,842	38,428	280,268	45,862	275,148	1,067,798	697,763	370,926	1,272,391	2,340,100
July	217,075	123,272	34,675	85,943	40,758	322,526	48,909	274,703	1,147,861	704,949	392,453	1,365,434	2,462,000
August	235,592	122,753	35,135	87,053	43,856	264,410	55,787	280,111	1,124,696	701,848	419,192	1,419,201	2,540,000
September	225,227	117,165	32,928	89,863	41,255	276,091	46,832	260,991	1,081,352	780,776	408,871	1,362,769	2,553,000
October	244,685	110,958	20,972	93,091	40,270	300,702	50,762	284,437	1,145,877	831,395	430,335	1,317,501	2,578,000
November	234,174	105,282	20,338	94,670	38,336	279,389	52,025	299,159	1,123,373	860,165	419,929	1,277,015	2,557,000
December	230,276	106,406	20,951	97,429	41,909	294,909	60,995	320,207	1,173,172	960,810	398,186	1,305,850	2,664,000
January, 1944	223,286	94,952	19,417	96,960	42,346	290,005	57,904	331,055	1,155,925	964,314	406,851	1,281,484	2,653,000
February	203,057	84,639	18,023	87,611	37,891	291,969	50,490	314,546	1,087,226	928,634	376,321	1,200,331	2,566,000
March	212,801	104,566	18,822	89,928	40,994	286,847	46,275	324,633	1,124,866	943,429	402,195	1,322,532	2,668,000
April	189,958	122,178	18,793	85,954	42,287	284,140	33,462	262,097	1,038,849	890,599	370,914	1,372,445	2,633,000
May	199,926	112,473	19,454	87,365	41,077	297,189	38,291	284,604	1,071,379	854,064	417,654	1,397,484	2,658,000
June	191,704	104,360	22,250	84,548	42,172	285,599	38,255	271,433	1,071,529	854,031	417,654	1,401,465	2,620,000

# FROM THE RESEARCH DIVISION OF WESTERN INDUSTRY

## Employment—Sloughing Off Continues

Estimated Number of Employees in Non-Agricultural Establishments—In Thousands—Source: U. S. Bureau of Labor Statistics

### ALL INDUSTRY DIVISIONS

	Montana	Idaho	Wyoming	Colorado	New Mexico	Arizona	Utah	Nevada	Total Mountain	Washington	Oregon	California	Total Pacific
May	111	106.6	60.5	280	78.3	118.9	173	47.4	976	643	351	2,694	3,688
June	112	101.3	61.4	285	79.1	116.2	173	47.3	974	655	361	2,726	3,742
July	112	100.4	61.0	284	81.8	112.4	180	44.8	976	673	362	2,734	3,769
August	113	98.4	61.9	287	83.2	108.7	178	41.9	972	665	361	2,776	3,802
September	115	102.0	62.1	290	80.7	107.6	175	44.0	978	675	362	2,717	3,754
October	114	101.4	62.1	288	79.8	109.2	172	42.1	969	667	350	2,702	3,719
November	114	100.5	62.1	282	79.0	111.0	168	43.1	960	666	344	2,691	3,701
December	114	98.8	61.6	279	79.0	111.0	165	41.7	950	666	345	2,696	3,707
January, 1944	110	95.0	60.6	265	76.4	108.4	150	40.4	906	644	334	2,635	3,613
February	109	94.1	60.8	265	76.8	108.6	147	40.0	901	638	333	2,629	3,600
March	109	95.5	59.4	259	76.4	108.2	142	39.9	889	636	332	2,605	3,573

### MANUFACTURING

	Montana	Idaho	Wyoming	Colorado	New Mexico	Arizona	Utah	Nevada	Total Mountain	Washington	Oregon	California	Total Pacific
May	14.2	13.4	3.7	64.0	4.2	13.8	30.8	4.9	149	255	148	1,050	1,453
June	14.4	14.0	3.8	65.0	4.5	13.1	33.7	5.5	154	263	153.7	1,061	1,478
July	14.5	15.2	3.9	67.0	4.7	13.5	40.4	5.2	164	274	157.3	1,080	1,511
August	15.2	14.2	3.9	67.0	4.6	13.4	36.9	5.0	160	271	157.9	1,142	1,571
September	15.2	15.8	3.9	68.5	4.3	13.2	35.8	5.1	162	279	161.3	1,088	1,528
October	15.9	15.7	4.3	69.2	4.3	13.6	36.4	4.8	164	278	150.8	1,066	1,495
November	15.8	14.9	4.5	65.0	4.9	16.5	32.1	5.0	159	277	146.6	1,052	1,476
December	15.0	14.3	4.0	58.6	4.9	16.5	28.2	4.7	146	273	145.0	1,034	1,452
January, 1944	13.9	12.8	3.7	53.7	4.8	15.9	22.4	4.6	132	267	139.1	1,016	1,422
February	13.8	12.6	3.8	53.5	4.8	15.4	20.8	4.5	129	264	136.6	1,008	1,409
March	13.7	13.0	4.0	47.9	4.8	15.7	18.8	4.2	122	262	134.9	987	1,384

## Oil—Six Months Report

Petroleum statistics for the first six months of 1944 indicate that total supply in the Pacific Coast territory increased 76,000 barrels daily over the comparable period in 1943, reports Edward T. Knudsen of the Petroleum Economics Division, U. S. Bureau of Mines. Total demand increased 124,000 barrels daily, however, so that 48,000 barrels daily more than in 1943 were supplied from storage. Withdrawals from storage averaged 68,000 barrels daily for the first six months of 1944 and brought stocks down to 85,748,000 barrels at the end of June, which is a little less than three months supply at the June rate of demand of 969,000 barrels daily.

Total demand (domestic demand is not available for publication) for all products for the twelve months of 1943 and the first six months of 1944, is shown below.

	All Products (Bbls.)	1943	1944
January	748,000	993,000	827,000
February	827,000	1,011,000	869,000
March	869,000	1,018,000	831,000
April	831,000	954,000	852,000
May	852,000	900,000	973,000
June	973,000	969,000	918,000
July	918,000	985,000	982,000
August	985,000	987,000	962,000
September	987,000	1,022,000	850,000
October	962,000	850,000	974,000
November	1,022,000	850,000	974,000
December	850,000	974,000	850,000
Jan.-June Average	850,000	974,000	850,000

## Aircraft—New Report System

A new method of recording completions was set up in July, resulting in a paper drop from the figures shown under the old system. Col. W. H. Dayton, acting western district supervisor of the AAF Materiel Command, said, however, that there had been no slackening in the production pace and that the Pacific Coast plants are meeting their production quotas, despite model changes. Figures for the year are as follows:

	No. of Planes	Total Pounds
December, 1943	2,527	30,880,000
January, 1944	2,559	31,892,000
February	2,569	32,469,000
March	2,703	36,015,200
April	2,295	30,993,000
May	2,569	34,234,000
June	2,276	32,284,500
July	1,890*	26,909,100*

\*Reported complete after modification, instead of on leaving factory, as previously.

## Freight—Upward Jump

Carloadings in the West in July showed a 33 per cent increase over June, while tonnage received from the East was up 25 per cent. Total tonnage handled was 30 per cent greater than in June.

Third quarter forecasts by the regional traffic advisory boards indicate a total increase in carloadings for that period over last year of 5.1 per cent for the Pacific Coast board territory and 1.8 per cent for the Pacific Northwest board. An increase of 24.8 per cent in agricultural implements and vehicles was predicted in the former territory, and 329 per cent in the Pacific Northwest on poultry and dairy products.

Total traffic figures for the railroads in the Far West are as follows:

	Loadings	Received from eastern connections	Total
March	421,188	320,763	741,951
April	489,777	336,101	825,878
May	505,610	333,480	839,090
June	559,037	333,709	892,746
July	746,085	418,606	1,164,691

## Iron—Movement Steady

Total iron ore shipments from mines in the Western States in June varied only slightly from May, but Utah and Wyoming output dropped while the California volume rose accordingly. Bureau of Mines figures in gross tons are as follows:

	Utah	Wyoming	Calif.	Total
March	133,901	86,291	54,014	274,206
April	123,417	63,081	49,078	235,576
May	134,733	70,535	54,477	259,745
June	96,699	64,652	63,055	224,406

## THE TREND

Pressure of war production promises even more severe in the next few months, because of the need of putting additional heat on Germany and of massing ships, men and equipment for heavier blows on Japan. Whether there will be still further curtailments in production of civilian items in the West remains to be seen. Rationing of lumber will be in that direction—considerable bootlegging in building operations apparently having been prevalent. The Navy's success against recalcitrant machinists in San Francisco may be the first step in tighter manpower controls.

## EMPLOYMENT—DURABLE GOODS INDUSTRIES

(Figures from Calif. Div. of Labor Statistics)

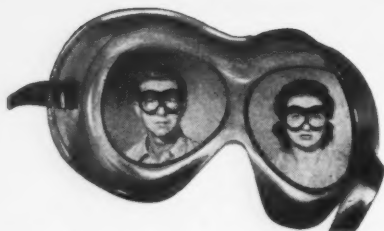
	San Francisco Bay Area	Los Angeles Indus'l Area	Total State
Jan. 1944	221,200	369,200	690,800
February	218,600	363,600	682,200
March	212,100	354,700	670,900
April	205,000	347,900	652,900
May	202,200	339,400	641,600
June	196,700	325,200	621,900

## Surplus—WPB Reports

Due to the recent change making various government branches the primary disposal agency of surplus materials, metals reported received by the San Francisco office of the Redistribution Division of WPB in July were considerably below the outgo. Figures, in pounds, were as follows:

	In	Out
Steel	3,180,650	5,259,839
Copper	318,334	482,027
Aluminum	11,145	85,191

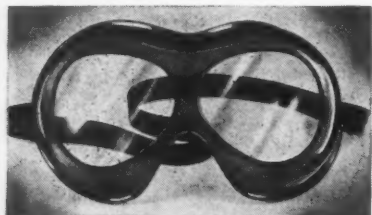




## You're Looking Through the New CESCO Cover-Lite Goggles

As you're looking through these new CESCO Cover-Lite Safety Goggles, you're practically experiencing their comfort—because when you actually have them on, you scarcely know they're there.

The combined weight of the lenses and the frame is only 96/100 of an ounce! The frame rests lightly—no pressure on the nose, brow or forehead. They're comfortably worn over prescription spectacles, too.



### Cover-Lite lenses are replaceable

Notice the clear plastic, non-shattering, replaceable lenses. They have remarkable strength, and assure safety against impact. Also available with green lenses; and with either transparent green (No. 552) or white marbled (No. 554) frames.

Write for complete information now.



### HOW TO SELECT INDUSTRIAL HEAD AND EYE PROTECTION

Before you buy safety equipment, see CESCO's new 48-page catalog. It's the standard for quality...write for your copy today.



**CHICAGO  
EYE SHIELD CO.**  
2322 Warren Boulevard  
Chicago 12, Illinois

**CESCO  
FOR SAFETY**

### Industrial Accident Rate Declines

Industrial accidents in California in 1943 reached a total of 550,809, nearly 11 per cent above the total in 1942, reports Paul Scharrenburg, director of industrial relations. Despite an increase of 16 per cent in disabling injuries, the number of fatalities, 698, is only 4 per cent above the year before. The number of disabling injuries in manufacturing increased from 57,079 in 1942 to 77,362 in 1943, or 35½ per cent, but as man hours worked increased more than 36 per cent, it indicates that the accident frequency rate was not only lower than in 1942 but the lowest in any year since 1939.

Shipyards, which accounted for the largest number of disabling accidents, had a considerably better record in 1943 than in 1942. While aircraft made a less favorable showing for 1943 than the year before, Scharrenburg reported that the industry has a good record for keeping down injuries and deaths.

### Kaiser Tax Assessment

Tax assessment value of the Kaiser steel mill at Fontana has been set by the San Bernardino county board of supervisors at \$10,200,000. This is an increase of 15 per cent over last year and a compromise from the \$6,000,000 sought by the Kaiser Company, who contended that steel mills throughout the United States pay an average property tax equivalent to \$8 per ton of finished product. The county assessor had originally set the assessment value at \$15,000,000. Up to March 1 of this year \$68,000,000 had been spent on the properties, according to company representatives at the hearing.

### King Of The Cafeterias

Boeing Aircraft Company's new \$650,000 cafeteria and food center at Seattle is the largest on the Pacific Coast. The cafeteria building is 212 x 220 feet and seats 1,600 persons, while the food service center is 92 x 214 feet and will supply food for 40 mobile units which will distribute meals throughout the factory area at lunch times. Each mobile unit is designed to serve ten customers per minute. Equipment includes an automatic pie-making machine with a capacity of 350 pies an hour. The entire inplant feeding program will be operated on a non-profit basis.

### Espee's Traffic Record

Southern Pacific net ton miles in 1943 were over 40 billion, an increase of 308 per cent over 1924 volume and 186 per cent over 1938, said W. W. Hale, vice president, system freight traffic, at the June meeting of the Pacific Northwest Advisory Board. Visualizing the present tonnage, he said the Pennsylvania, operating in a high traffic density territory and handling an enormous volume of iron, steel, coal and other

heavy commodities, handled about 71 billion miles.

### Factory-fit Doors

Improving still further Douglas doors, which long have been manufactured under U. S. Commercial Standards of quality, fir door makers now are introducing factory-fit and machined closures as stock interior doors. Rather than being made oversize to be hand-trimmed on the job, they are cut to exact dimensions by precision machinery and are ready to hang when they leave the mass-production door factories.

### Labor Relations Movie

"Three To Be Served" is the title of an educational featurette produced by the educational film division of Paramount for the National Industrial Information Committee of the NAM, a dramatization of the theory of the triangle of plenty, the relationship of labor, capital and the consumer to management. J. A. Hartley, Alden Roach, Paul Shoup and K. T. Norris were among those in attendance at the premier at Hollywood.

### Big Tungsten Pile

Around 70,000 tons of tungsten ore, the largest stock pile of its kind in the United States, have accumulated near the Getchell Mine in Nevada. It is worth over \$1,000,000, but no government agency has revealed what will become of it.

### Ship Supervision

A central commissioning detail for the area has been set up by the 12th Naval District at San Francisco to supervise the outfitting of naval craft, following a ship through its construction period and trial runs.

## OPPORTUNITY SECTION

This widely-read column can help you to sell your used machinery and other used equipment. For rates, write to the Opportunity Section, *Western Industry*, 503 Market Street, San Francisco, California.

### LITTLEJOHN-REULAND CORPORATION

Los Angeles, California

Representing  
Westinghouse Electric & Manufacturing Co.  
INDUSTRIAL AGENTS

With stock of new electric motors and motor control for immediate delivery

★

### LITTLEJOHN-REULAND CORPORATION

Revolving 2655 Santa Fe Avenue Repairing  
Jefferson 6255 Los Angeles, Calif. Jefferson 6255

# THE WEST ON ITS WAY

## ARIZONA

**CONSTRUCTION CAMP**—McGinty Construction Co., Luhrs Bldg., Phoenix, has been awarded subcontract by the L. E. Dixon Co., Los Angeles, and Arundel Co., Baltimore, Md., at approximately \$40,000 for the construction of three dormitories and a mess hall for construction crews at the Horseshoe Dam site near Phoenix.

**ANTENNA SYSTEM AND RADIO BUILDING**—Donaldson Construction Co., Los Angeles, Calif., has been awarded a contract by the Civil Aeronautics Administration at \$21,350 for erecting five steel antenna towers for radio facility building near Prescott.

**THEATRE BUILDING**—Porter Womack Construction Co., Phoenix, has the contract for construction of a theater building for Publix-Richards-Nace, Inc., Orpheum Theater Bldg., Phoenix. Estimated cost, \$125,000.

**LEMON PACKING PLANT**—Bids are being received for the construction of a lemon packing plant at Phoenix, for the Arizona Citrus Growers' Association.

**PREFABRICATED STEEL HANGAR**—Vinson Construction Co., 2020 W. Grant St., Phoenix, has been awarded a contract at \$14,451 for the erection of a prefabricated steel hangar building.

## CALIFORNIA

**RECEIVING CLINIC**—A new receiving clinic and patients effects building will be built at the Torrey General Hospital at Palm Springs at a cost of \$59,839.30. Project recommended by Aircraft Resources Control Office.

**IN-PLANT FEEDING**—Western Pipe & Steel Co. at San Pedro was authorized to build a \$175,000 installation for in-plant feeding.

**PROCESSING MILL**—Provision for a \$400,000 processing mill at Bakersfield to supplement the old mill at Salinas is included in the total of the Agriculture Appropriations Bill just passed by the Senate.

**EXTENSION**—Kaiser Co., Inc., has been awarded a \$25,000,000 Army Ordnance contract to manufacture eight inch and 155 mm. shells. Except for finishing operations, the shells will be manufactured in an extension to be constructed at the Kaiser Steel Mills in Fontana.

**RESEARCH ENGINEERING**—A company has been formed by A. H. Smith and will establish its operations at 2624 North Fair Oaks Avenue, Altadena.

**STEEL CO.**—H & M Steel Co., organized by John Alexander Moore, is conducting its operations at 2466 South Tenth Avenue, Arcadia.

**PLANT ADDITION**—Cousins Tractor Co., 424 Twenty-fourth street, Bakersfield, will build a repair plant addition costing \$25,000.

**COMMISSARY SYSTEM**—Lockheed Aircraft Corp., Burbank, has received priorities for erection of an extensive new commissary system at its factory A, to cost about \$450,000.

**TELESCOPIC GAS HOLDER**—The municipal gas department of Long Beach, Calif., will build a 5,000,000 cubic foot telescopic gas holder costing \$695,000 complete, and four 500,000-cubic foot high-pressure tanks costing \$470,000.

**ROUNDHOUSE**—Western Pacific Railroad will build roundhouse at foot of Adeline Street, Oakland, at a cost of \$26,000.

**CONSTRUCTION**—Dinwiddie Const. Co., 210 Crocker Bldg., San Francisco, has been awarded \$55,958 contract by Navy Department for construction work at the Naval Air Stations, Livermore and Treasure Island, Calif.

**CONSTRUCTION**—MacDonald & Kahn, Inc., San Francisco, have been awarded contract by Navy Department, for construction at Auxiliary Air Station, Santa Rosa, Calif.

**COMBATING  
BACTERIA GROWTH  
in  
OIL-WATER CUTTING  
SOLUTIONS**

← *This  
Special Service  
Report  
FREE  
for the asking!*

By employing the preventive measures described in this 4-page Oakite Special Service Report, you can effectively clean out main supply coolant tanks, individual tanks on machines, supply lines and pumps. The procedures recommended will minimize and control dermatitis infection, as well as prevent coolant rancidity. Write our nearby representative for your free copy today.

### OAKITE PRODUCTS, INC.

LOS ANGELES (12) ..... 1001 East First St., Tel. Madison 1544  
SAN FRANCISCO (7) ..... 115 Townsend St., Tel. Douglas 5640  
OAKLAND (7) ..... 1505 Wood St., Tel. Glencourt 2750  
SAN DIEGO (1) ..... 310 Fifth Ave., Tel. Franklin 0312  
SEATTLE (4) ..... 95 Connecticut St., Tel. Main 1207  
PORTLAND (9) ..... 1238 N. W. Gilsen St., Tel. Broadway 1281  
DENVER (2) ..... 1700 15th St., Tel. Main 3221

**OAKITE**



**CLEANING**



**ROLLING TO  
WASHINGTON  
IN LOWER 5**

The Army wanted action. Traveling via pullman we got it there on time so that the boys on the fighting front

could have the best, on time!

Rapid-Wheel conveyor with the new portable "Cam-lock" supports is a new conception of labor-saving now available for civilian use. It is quick and easy to adjust from a minimum of 6" to a maximum of 50" operating height. Each unit is self-contained and self-supported on easy rolling wheels.

Take the "lift" and "lug" out of your conveying operations. Write for bulletin C142-B today! The Rapids-Standard Company, Inc., 5352 Bond Avenue, N. W., Grand Rapids 2, Michigan.

Offices in Principal Cities

**Rapid-Wheel CONVEYORS**



## Specializing ON NON-FERROUS and STAINLESS FASTENINGS

### Only NON-FERROUS AND STAINLESS FASTENINGS

**W**HEN you have a toothache you go to a dentist.  
When you need legal advice you go to a lawyer.  
Both men are specialists.

By the same token . . . when you need non-ferrous and stainless fastenings come to the house that specializes on them . . . Come to the Harper Organization which is concerned exclusively with the manufacture of bolts, nuts, screws, washers, rivets and specials of Brass, Copper, Naval Bronze, Silicon Bronze, Monel and Stainless . . . an organization not concerned with common steel.

This specialization brings refinements in product quality and "extras" in service to customers that are most rare. Start these "extras" your way by writing on your company letterhead for a complimentary copy of a 4 color, 104 page catalog and reference book.

**THE H. M. HARPER COMPANY**  
2649 Fletcher Street • Chicago 18, Illinois  
BRANCH OFFICES: New York City • Philadelphia  
Los Angeles • Milwaukee • Cincinnati • Houston  
Representatives in Principal Cities



## THE WEST ON ITS WAY

**PLANT FACILITIES**—Expansion of facilities has been announced by Food Machinery Corporation in plants at San Jose and Riverside, Calif., to meet demand of the Navy Department for more amphibian tanks.

**BUILDINGS**—R. E. Campbell, Compton, has been awarded \$86,275 contract for construction of buildings at Roosevelt Base, Terminal Island, Calif.

**STOREHOUSE EXTENSION**—Coast Counties Const. Co., Salinas, has been awarded contract by Navy Department for extension of storehouse, etc., at Vernalis and Crows Landing, Calif.

**BATTERY & PAINT SHOP**—Campbell Const. Co., 800 R Street, Sacramento, has been awarded \$55,382 contract by U. S. Engineer Office, Sacramento, for construction of battery and paint shop at McClellan Field, Calif.

**STORAGE SPACE**—M. H. Golden, 3485 Noell Street, San Diego, has been awarded \$90,387 contract by U. S. Navy, for construction of storage space at the Naval Air Station, San Diego, Calif.

**BOMBER RANGE**—The Navy has filed condemnation proceeding against 522 acres of arid land in Inyo, Kern and San Bernardino Counties for its use as a Naval ordnance testing grounds.

**WHARF, PIERS, ETC.**—Clinton Const. Co., 923 Folsom Street, San Francisco, has been awarded contract by U. S. Navy for construction of wharf, gangway, piers, and dolphins swell, and landing craft depot at Oakland Municipal Airport, Oakland, Calif.

**ENGINE OVERHAUL BUILDING**—Mead & O'Donnell, 7769 Mead Avenue, Los Angeles, have been awarded \$108,002.05 contract by U. S. Dist. Engineer Office, Los Angeles, for construction of engine overhaul building and facilities at the San Bernardino Army Air Depot, Calif.

**TEST STATION**—Macco-McKittrick-Morrison, Los Angeles, have been awarded contract for construction of a Naval ordnance test station at Inyokern, California, to cost about \$40,000,000. The project includes warehouses, utility buildings, laboratory buildings, shops, etc.



## INDUSTRIAL RUBBER PRODUCTS

Hose — Belting — Packings

Rubber Clothing — Boots — Specialties



## GOODALL RUBBER COMPANY

(CALIFORNIA)

LOS ANGELES 510-514 E. 4th St. Michigan 2207  
SAN FRANCISCO 618-A Howard St. SUTTER 7944  
SALT LAKE CITY 251 W. South Temple St. Rm. 3 8021  
SEATTLE 524 First Ave. S. Elliott 7043  
Mills—Trenton, N. J., established 1870



**UTILITY ADDITION**—Carrico and Gautier, 365 Ocean Avenue, San Francisco, have the contract for construction of a utility addition on Butler Avenue, South San Francisco, for the Western Pipe & Steel Company, South San Francisco, Calif.

**COLD STORAGE LOCKER BUILDING**—Smith & Whitney, 149 N. "B" St., Exeter, have started work on the construction of a quick freeze and cold storage locker plant on E. Palm St., Exeter, Calif.

**CAFETERIA BUILDING**—H. Philip Cash, North Hollywood, will build a frame and stucco cafeteria building at 216 E. 21st St., Los Angeles, for the Knudsen Creamery, 48x55 ft. in area. Cost, \$6,000.

**OFFICE BUILDING**—Plans have been made for the construction of a 2-story reinforced brick construction office building at 1753 N. Workman St., Los Angeles, for the Republic Supply Co. of California.

**FACTORY BUILDING**—Plans have been made for the construction of a steel frame and corrugated iron factory building, 150x250 feet in area, at factory A, Burbank, by the Lockheed Aircraft Co., 2555 Hollywood Way, Burbank.

**PRINT SHOP**—Robert E. Millsap, 437 S. Hill St., Los Angeles, will build a print shop at 5899 Venice Blvd. for the Los Angeles Daily News, 60x100 ft. in area. Cost, \$30,000.

**FILM CUTTING LABORATORY**—The Austin Co., 777 E. Washington Blvd., Los Angeles, will add a second story to a film cutting laboratory at 959 Seward St. for Consolidated Film Industries, Inc., 23x35 ft. Cost, \$10,000.

**REHABILITATE MACHINE SHOP**—Barrett & Hilp, San Francisco, awarded contract by the U. S. Navy, Bureau of Yards and Docks, Washington, D.C., at \$125,000 for rehabilitation of the machine shop at Mare Island Navy Yard.

**WATER TANK**—The Pittsburgh Des Moines Steel Co., San Francisco, has been awarded a negotiated contract by the U. S. District Engineer Office at \$16,256 for construction of an elevated water tank at the Shell plant in Fontana.

**FACTORY BUILDING**—H. M. Keller Co., 4604 Hollywood Blvd., Los Angeles, has been awarded a contract by the Lockheed Aircraft Corp., Burbank, at \$50,462 for the construction of a wood frame factory building 30x480 feet in area.

**GAS PLANT**—Building permit has been issued for construction of a butadiene gas plant at 827 Center St., Los Angeles, for Defense Plant Corp., by Southern California Gas Co. of 810 South Flower St. A. D. Stauffer is engineer.

**GAS PLANT EXPANSIONS**—Los Angeles oil production urgency committee of the War Production Board has approved 100-octane gasoline plant expansions in Southern California totaling \$6,249,553, of which \$4,291,910 is for the General Petroleum Corp. refinery of Torrance, California, and the remainder for technical improvements at refineries of the Wilshire Oil Co., Texas Co., Shell Oil Co., and Standard Oil in areas adjacent to Los Angeles.

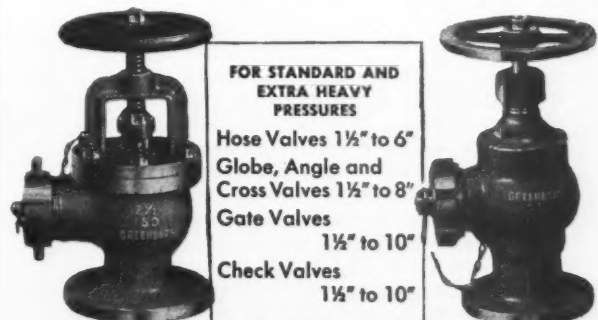
**BRASS FOUNDRY**—Lynch Ornamental Aluminum & Brass Foundry will build a new brass foundry at Southeast 76th Ave. and Hawley St., Oakland.

**PLANT EXPANSION**—Merco-Nordstrom division of Pittsburgh Equitable Meter Co. has leased buildings and 36,000 square feet for expansion of its plant in Oakland.



**90 YEARS OF SPECIALIZING**  
**THE WEST'S PIONEER HYDRANT**  
**MANUFACTURER BRINGS YOU**  
**GREENBERG**  
**"TITE-TEST"**  
**BRONZE**  
*Hose* **VALVES**  
**for "ASSURED RESULTS"!**

**NOW available through YOUR**  
**JOBBER...from Vancouver to San**  
**Diego...the name GREENBERG**  
**is your Assurance of Quality!**



CAT. No. 774

CAT. No. 1774  
 100 lb. NAVY SPEC. 45V4

**FOR STANDARD AND**  
**EXTRA HEAVY**  
**PRESSURES**  
**Hose Valves 1½" to 6"**  
**Globe, Angle and**  
**Cross Valves 1½" to 8"**  
**Gate Valves**  
**1½" to 10"**  
**Check Valves**  
**1½" to 10"**

**INDUSTRIAL PROPERTIES**  
**Sales • Leases • Appraisals**  
**COMPLETE COVERAGE**

*Up-to-the-Minute Lists*  
**Warehouses • Buildings • Lofts • Plants • Factory Sites**  
**Dismantled Steel Buildings**



**COLDWELL, BANKER & COMPANY**  
**REALTORS**

**57 Sutter Street**      **SAN FRANCISCO 4**      **Phone: SUtter 5420**  
**14th and Franklin**      **OAKLAND 12**      **Phone: GLancourt 7300**  
**523 W. 4th Street**      **LOS ANGELES 14**      **Phone: MADison 7811**

**STABILITY**  
*Since 1854*

**M. GREENBERG'S SONS**  
 765 FOLSOM STREET ★ SAN FRANCISCO, 7

When the Temperature  
has 2000° on  
the unit



**Insulation  
must stand  
up or...**

**Hell breaks loose!**

Over \$175,000,000 of aviation gasoline refineries in Southern California alone are being insulated by MARINE. Some of the hot units of these plants involve temperatures of 900° to 2000° F. The engineers and contractors on these plants can't take chances. They must avoid every possible risk. Insulation must stand up. That is why they specify MARINE. They know MARINE insulation is custom-engineered to the job and backed by a record of success in countless industrial applications. One of our representatives will gladly discuss your insulation problems.

**Marine** 

**ENGINEERING & SUPPLY COMPANY**

941 EAST SECOND ST. • LOS ANGELES • MICHIGAN 8071

## THE WEST ON ITS WAY

**WELDING EQUIPMENT PLANT**—Glenn-Roberts Co. will erect a \$20,000 plant at 3100 East Tenth St., Oakland.

**RUNWAYS**—Five runways, fanning out into San Francisco Bay like spokes of a wheel will be constructed at Mills Field to make the airport capable of handling the largest aircraft now being made.

**MACHINE PARTS**—Carroll Products Co., manufacturer of screw machine parts, will start new business at 4321 San Leandro St., Oakland.

**PLUMBING**—Scott Co., plumbing contractor, has bought 60,000 sq. ft. at Southwest Park and Horton streets, Oakland, and will build new plant when priorities can be obtained.

**PLANT PROPERTIES**—Universal Microphone Co., Inglewood, Calif., has purchased the physical properties of the plants it has occupied the past twelve years. The transaction involved plants numbers 1 and 2, the annex and paved parking lots. The company had utilized the premises on a rental basis.

**PORTABLE SHELTERS**—Northwest Fabrications of Albany, Oregon, has been awarded a contract of \$174,750 for the construction of 120 portable shelters at Pittsburg, Calif.

**MACHINE SHOP**—A. H. Karpe Implement Co., 606 East 18th St. Bakersfield, is building a galvanized steel machine shop building, 7½ x 134 ft. Cost, \$9,000.

**SERVICE BUILDING**—Atchison, Topeka & Santa Fe Railroad has let contract to Swinerton & Walberg Co., 805 West Olympic Blvd., Los Angeles, for a diesel engine service building at Barstow, one stop, 138x325 feet, to cost with equipment about \$850,000.

**PLANT PURCHASE**—Rheem Mfg. Co. has bought San Francisco area properties of Inland Steel Co., Chicago, which has completed war assembly contracts. Machinery has been removed, leaving plant ready for Rheem production. Price is about \$70,000.

**STORAGE BUILDING**—Aircraft Industries Co. is building a repair shop and storage building at 1224 Airway, Glendale, to cost about \$17,600.



**HUSKY Forgings**

... Made from our own controlled quality steel. Today Isaacson-forged shafting turns the wheels of a vast number of the nation's ships. Tomorrow the experience, spanning two wars, will again be yours for winning the peace.

**ISAACSON**  
SEATTLE

**PLANT ADDITION**—Aircraft Accessories Corp. will build a plant addition at 166 West Olive Ave., Burbank.

**PLANT ESTABLISHED**—Whiteman Aviation Co. has been formed by M. E. Whiteman and has established its plant at 3249 Casitas Ave., Los Angeles.

**MACHINE SHOP**—General Machine Works, 3023 San Fernando Rd., Los Angeles, will build a machine shop addition 51x66 feet, to cost about \$5,500.

**MACHINE SHOP ADDITION**—Consolidated Steel Corp. will build a machine shop addition at 5700 South Eastern Ave., Maywood district, Los Angeles, 78x100 feet, to cost about \$25,000.

**NEW PLANT**—Pacific Oxygen Co. will build a new plant at 2205 Magnolia St., Oakland, to handle expanded business.

**ADDITION**—Pacific Screw Products Co., South Gate, is building an addition to its plant at 5211 Southern Ave.

**FUEL TANK**—McCullough Tool Co., 5818 South Alameda St., Vernon, will build a fuel tank to cost about \$2,000.

**PLANT BUILDING**—Kinney Aluminum Co., Vernon, will build a plant building at 5900 South Boyle Ave., to cost about \$2,000.

**MACHINE SHOP ADDITION**—Nemec Engineering Co. is building a machine shop addition at 2430 West Whittier Blvd., Whittier, 44x52 feet, to cost about \$2,500.

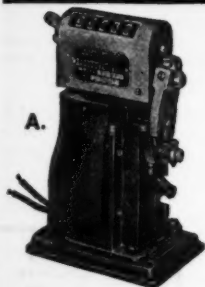
**FLOATING WAREHOUSES**—Plans have been announced for conversion of 13 ship-shaped concrete barges at Belair Shipyard, San Francisco, into huge "floating warehouses" for the Navy, expected to total more than three million dollars.

**AIRPORT**—Moves for a 20-million-dollar Golden Gate International Airport to be located on the Berkeley-Albany tidelands, were advanced with arrangements for having plans drawn up for the project through engagement of R. Benedict Brout, engineer.

**PLANT**—T. & G. Tool Co. has been organized by Frank J. Tennant and Arthur G. Gautschi and will be established at 1115 North Mission Road, Los Angeles, Calif.

*Wherever there's production  
to be counted . . . you'll need*

## PRODUCTIMETERS



**W**AR times are tuned to "that which is essential." It is essential that exact records be kept on the production machines of the nation . . . essential that those machines be equipped with Productimeters to record pieces or parts produced, count strokes or revolutions, measure feet or yards, count cases on conveyors. Over 100 standard models to choose from . . . designed for speed and accuracy . . . built for hard usage.

In 85% of counting applications, a standard unit will meet requirements. Write for

Bulletin No. 100

A concise, ready reference catalog of 100 standard models.

- A. Electric Unit 5-D-1-MF
- B. Stroke Counter 6-H-1-2
- C. Conveyor Unit 5-H-5

**DURANT MANUFACTURING COMPANY**

1949 North Buffum Street **PRODUCTIMETERS** Milwaukee, Wisconsin

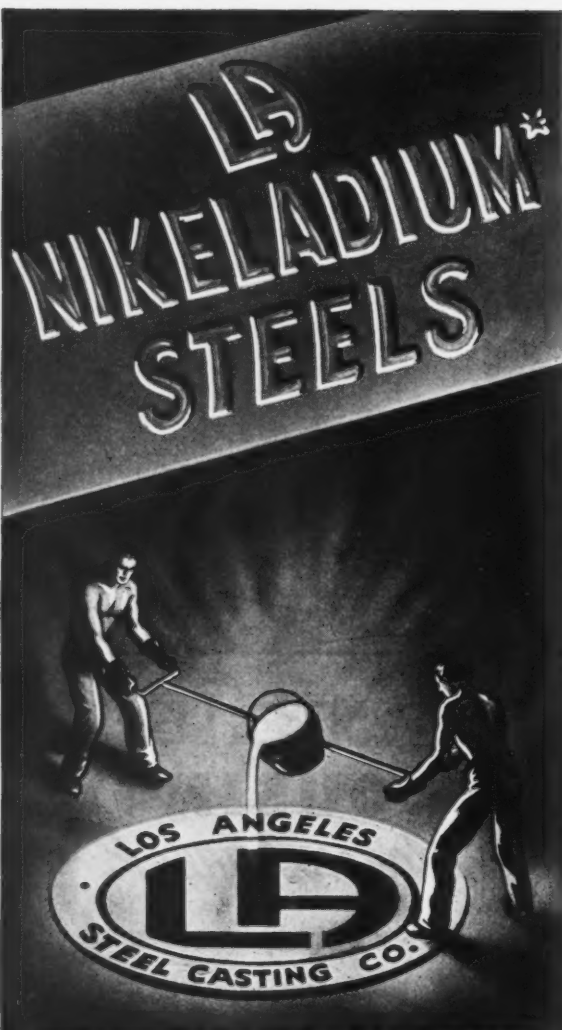
*So...* no repairs — no repair expense — no wrenches out of use

● When you use **RIDGID**s, you don't need so many spares around—for these wrenches usually last till you lose them. Ask any of the millions who use them. They'll tell you also that the full-floating hookjaw and the adjusting nut *always* work freely, never bind. The no-slip jaws, handy pipe scale on hookjaw and comfort-grip I-beam handle are also things you'll like. For economy and easier work, buy the **RIDGID**—at your Supply House.

**THE RIDGE TOOL COMPANY • Elyria, Ohio**







**★ NOT JUST STEEL  
BUT A STANDARD OF QUALITY**

You get maximum quality when you choose **NIKELADIUM STEELS**! Regardless of the analysis specified, our entire staff takes pride in seeing that your job fully meets the standard of quality that Western industry has learned to associate with the name **NIKELADIUM**.

**LOS ANGELES  
STEEL CASTING COMPANY**

2444 So. Alameda St. • Los Angeles, California

FITTINGS SOLD THROUGH DEALERS ONLY

**THE WEST ON ITS WAY**

**PLANT**—Crescent Tool Co., Paul J. Powers, proprietor, will open a plant at 3369 Cherry Avenue, Long Beach, Calif.

**ADDITION**—North American Aviation Inc., 5701 Imperial Highway, Venice, Calif., will build an addition to its press building to cost about \$100,000.

**COLORADO**

**BUILDING ADDITIONS**—Walter H. Harris, 4245 Grove St., Denver, has been awarded a contract by the Colorado & Southern Railway for the construction of a one-story brick and concrete addition to the roundhouse office and another one-story addition to the Supt. of Motive Power office at the C. & S. yards, Denver.

**MONTANA**

**PILOT PLANT**—The International Minerals and Chemical Corporation is constructing a pilot plant for milling phosphate rock in Granite County near Hall, Montana.

**OREGON**

**POWER PLANT**—Pacific Power & Light Co., Portland, Oregon, plans Cove power plant on Crooked River at cost of about \$300,000.

**TIMBER STANDS**—Purchase of the entire holdings of the North Bend Logging Co. by the St. Regis Paper Co., has been announced. The Tacoma plant is now assured a log supply considered sufficient to last for 20 to 25 years of continuous operation.

**BROADCASTING STATION**—The Oregonian Publishing Co., Portland, has asked the Federal Communications Commission for authority to construct a new broadcasting station in Portland, to be operated on 46,100 kilocycles with coverage of 13,382 square miles.

**FREIGHTERS**—Four small freighters, originally designed for Pacific Coast lumber trade, will be completed by the Albina Engine & Machine Works, Oregon, for use in inter-island cargo operations during the remainder of the war.

**WOOD CHEMICAL PLANT**—Construction of the Willamette Valley wood chemical plant is under way at Springfield. Cost, \$2,500,000.

**HOSPITAL CONSTRUCTION**—Plans for the construction of a \$500,000 five-story hospital have been announced by the directors of the Deaconess Hospital in Salem.

**COAL PRODUCTION**—The Coast Fuel Corporation formed recently to mine coal in Coos County has started purchasing machinery with a view to an initial production of 200 tons daily.

**NEW PLANT**—Plans of Canada Dry Ginger Ale, Inc., to establish a \$280,000 plant in Portland after the war to serve the Pacific Northwest with a monthly payroll of around \$28,800. The proposed site includes about 32 city lots.

**GRUENDLER CRAFTSMANSHIP**  
*Serving Industry over 50 Years*

**Peak Production at Low Cost**  
Manufacturers of Limestone Pulverizers, Gravel or Rock Crushing and Screening Plants, Conveying and Screening Equipment, Chemical Grinders and Mixers.

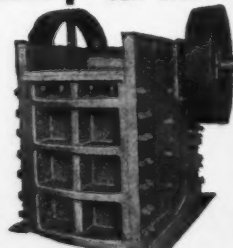


Write for  
Data and  
Illustrated  
BULLETINS  
about our  
Lifetime  
Crushing  
Equipment

**GRUENDLER**  
**CRUSHER and PULVERIZER CO.**

2915-17 North Market St., ST. LOUIS 16, MO.

**Heavy Duty  
Jaw Crushers**



150 to 200 tons per  
Hr. Crushing Steam  
Shovel Rock to 5"  
and 6" minus. Size  
24 x 42 wt. 54,200 lbs.

## UTAH

**GASOLINE PROCESSING**—Mountain Fuel Co., Rock Springs, Wyo., has been given preference ratings by WPB for installation of facilities and equipment for processing gasoline at Coalville, Utah, at a cost of about \$950,000.

## WASHINGTON

**SHIPYARDS**—Friday Harbor Shipyards, Inc., Friday Harbor, Wash., has been organized with \$10,000 capital by L. Wilson and associates.

**POST OFFICE BUILDING**—Chisholm & Eiford, Bellingham, were awarded contract by the U. S. Naval District, Public Works Office at \$13,990 for the construction of a post office building at Whidby Island, Wash.

**ADDITIONAL HOUSING**—Western Construction Co., 419 Artie building, Seattle, awarded contract by Capt. C. A. Duncan, U. S. Navy, Public Works Office, 13th Naval District at \$106,615 for the construction of additional housing facilities for general detail personnel at the U. S. Navy Receiving Barracks, Houghton, Wash.

**PLANT FACILITIES**—The Boeing Aircraft Co. is enlarging its branch plant facilities at Everett.

**DRYDOCK**—Facilities for drydocking a ship of 18,000 tons will be provided by the Navy at the Seattle Division of the Todd Shipyards Corporation. A steel drydock, built in the plant of Everett-Pacific Company in Everett, has been towed to Seattle.

**POST FALLS PROJECT**—More than 3,000 acres of land adjacent to Post Falls, Idaho, will be brought under irrigation in 1945, it was assured following a conference of Bureau of Reclamation officials and representatives of the North Idaho Water Conservation Project in Spokane.

**SILICA PLANT**—The creation of a mining division of the Bellingham Iron Works, Inc., to operate a silica plant with a newly patented milling machine at Bellingham. The silica mining deposits are in the upper Skagit regions.

**TRAILER CAMP**—A. D. Ford & Son, 417 S.E. Clay, Portland, Ore., awarded contract at \$63,375 for the construction of a camp for 200 government-owned trailers in the Pasco area.

**HOUSING PROJECTS**—Study has begun at the request of The Kaiser Co., Vancouver, Washington, to determine the cost of remodeling 5300 units of temporary row housing in three housing developments at Vancouver. Preliminary estimates placed at \$3,500,000.

**HEAT TREATING AND HERESITING PLANTS**—Gaasland Construction Co., Bellingham, awarded contract by the U. S. Navy, Bureau of Yards and Docks, Washington, D.C., at \$77,500 for the construction of heat treating and heresiting plants at the Naval Torpedo Station, Keyport.

*For Plant Conversion  
or New Planning*

THE *Lowe-Stoddard* co.  
**ENGINEERS & CONSULTANTS**  
MECHANICAL • ELECTRICAL • INDUSTRIAL

315 ARCHITECTS BUILDING  
LOS ANGELES 13 • Michigan 1133

## ERADICATE FIRE-SCALE and SOOT with XZIT

XZIT brings you complete freedom from soot and fire-scale. Stops sparking and stack fires instantly. Simply feed XZIT into the fire box while your boilers are operating. It reduces accumulated fire-scale and soot chemically. No chipping or scraping needed. XZIT keeps heating surfaces constantly clean, saves fuel, reduces smoking and saves upkeep time and labor. Use Diesel XZIT to eliminate carbon and soot in manifolds.



## PROTECT REFRACTORY SURFACES with BRICKSEAL

Protect the surface. Save the brick. A simple application of Brickseal provides a highly glazed, vitrified, monolithic coating that protects your refractories against chipping, cracking, spalling and deterioration usually caused by sudden change in temperature, slagging, clinkering and flame abrasion. Remains semi-plastic until the boiler cools. Cannot crack, peel or blister. Easy to apply with brush or spray gun. Boiler is ready for operation immediately after application.



## COAT TANKS and INTERIOR BOILER SURFACES with SERVIRON

A permanently plastic protective coating for the inside of hot and cold water tanks and boiler drums. Protects metal against corrosion, pitting, rust and fungus growth. Economical. One gallon covers 125-150 sq. ft. Only one coat needed. Easy to apply with brush on clean dry surfaces. Waterproofs wood and concrete tanks.



*For Better Boiler Operation*

Ask for  
Demonstration

Use These  
**SAVERITE PRODUCTS**

**S A V E R I T E  
ENGINEERING COMPANY**

5800 S. Hoover St., Los Angeles 44, Calif. TWInoaks 1-171  
ANCHORAGE, ALASKA Elmer Fern, P.O. Box 728  
SEATTLE W. H. Robes, 1016 1st Ave. S.—Elhoft 5007  
PORTLAND K. B. Barnall, 1233 N.W. 12th Ave.—BR. 0561  
CHICO Dan L. Buckman, P.O. Box 278—2298 W  
SAN FRANCISCO Walter Harris, 200 Davis St.—DOuglas 8590

# WESTERN TRADE WINDS

NEWS ABOUT THOSE WHO DISTRIBUTE AND  
SELL INDUSTRIAL EQUIPMENT AND MATERIALS



A. M. Smith

Arthur as chief engineer. Mr. Smith's new appointment places him in charge of all manufacturing activities.

Eugene Caldwell, general manager of the Hyster Company, formerly known as the Willamette Hyster Co., Portland, Oregon, has been elected a vice president of that organization. Mr. Caldwell is a technical author and holds mechanical and electrical engineering and legal degrees. W. B. Morrow, formerly personnel manager, will head a new department of a confidential nature. Cliff Dunham who has been in charge of the Hyster Chicago office becomes personnel manager.

## NORTHWEST MANUFACTURERS

Do you need an advertising man—one with 10 years' advertising agency experience? Address inquiries c/o Box 701, Western Industry, 503 Market St., San Francisco, California.

SHIPPING ROOM  
SUPPLIES

FACTORY EQUIPMENT

"MARKWELL"  
STAPLING DEVICES

FISHSTROM  
SALES CO.

SAN FRANCISCO  
88 First Street GARfield 6694

OAKLAND  
608 16th Street GLencourt 1174

LOS ANGELES  
122 E. 7th Street VAndike 4446

C. J. Coberly, president of Kobe, Inc., Huntington Park, California, has announced changes in executive positions in keeping with the enlarged facilities of the company. A. M. Smith has been appointed to the new position of production manager; W. C. Marston continues as assistant treasurer; H. K. Browning as general sales manager and R. F. Mc-

The Buda Company of Harvey, Illinois, have appointed Bert B. Fornaciari of Los Angeles as exclusive parts distributor for California for both the Buda Chore Boy and the complete line of Buda jacks in addition to their other regular lines.

James L. McClure, engineer and public relations representative, has been named dealer supervisor on the Pacific Coast for Allis-Chalmers Manufacturing Co. Mr. McClure plans to coordinate dealer problems, promote sales and assign new dealer-representatives in territories now open.

Chemical Salesmen's Association of California held their annual golf tournament recently at the Presidio Golf Club, San Francisco. J. F. Smith, sales manager of Dow Chemical Co., won low gross and L. F. Cummings, assistant secretary of Stauffer Chemical Co. won low net while L. H. Reyburn, vice president of Braun-Knecht-Heimann Co., was nearest the pin and L. H. Butcher, San Francisco made the longest drive.

Ballard Aircraft Co., Inc. of New York are establishing western headquarters in the Hobart Building, San Francisco, according to the district manager, E. H. Bridgman.

Stephen Miranda of Los Angeles appointed as industrial relations consultant for the "Victory-Builders" program for Southern California. "Victory-Builders" is a division of Bressler Editorial Cartoon, Inc., New York. Regional headquarters have been established at 1816 South Brand Avenue, Los Angeles.

M. E. (Jim) Adams has been appointed West Coast representative for Huck Mfg. Co., Detroit. Formerly associated with Cherry Rivet Co., Los Angeles, Mr. Adams assumes responsibility for sales and engineering service in the Pacific Coast territory for the Huck company's line of rivets.

W. C. Walsh has been appointed a district representative of the General Electric's Electronics Department and will be located in the San Francisco office. Mr. Walsh is a member of the American Institute of Electrical Engineers and the Institute of Radio Engineers and for the past several years has been associated with the U. S. Department of Agriculture as electrical design engineer.

The Eccles and Davies Machinery Co., Inc., 1910 Santa Fe Avenue, Los Angeles, has been appointed southern California representative of Lester Phoenix, Inc., of Cleveland to handle their complete line of die casting machines and injection molding machines for plastic materials. Chris Eccles and George A. Davies, Sr. are partners of the West Coast firm.

The Euclid Road Machinery Company announce the appointment of Columbia Equipment Co., 1240 S.E. 12th Avenue, Portland, Oregon as distributors of their equipment in the following counties in Washington: Wahkiakum, Cowlitz, Clark, Skamania and Klickitat; also in most of the counties in Oregon.

George W. Schriver, northwest representative for the Mall Tool Company for Oregon, Washington, Idaho, Montana and Northern California, is manager of their newly opened office at 138 S. W. 4th Avenue, Portland.

Jean Wynkoop was recently appointed to the Los Angeles Organic Research staff of Tuto Products, Inc. Miss Wynkoop took her A.B. degree at Whittier College, was assistant research librarian at Union Oil Company in Wilmington, California and an instructor in mathematics at Marlborough School for Girls.

Whitman & Barnes recently opened a new branch at 2305 East Eighth Street, Los Angeles 21, California. E. L. Foreman is manager of the new branch.

Frank S. Capps, after 18 months on the outside in Southern California territory is inside again as store manager for Moore Machinery Company.

Blake, Moffitt & Towne, pioneer wholesale distributors on the Pacific Coast with headquarters in San Francisco, are now distributing the WHIZ Industrial Products line manufactured by R. M. Hollingshead Corporation. Coastwide distribution is accomplished through the company's chain of sixteen divisions.

California Goggle Company, 1651 Cooma Street, Los Angeles 28, Calif., western representative for Watchmoke plastic safety goggles, announce the appointment of Davis Equipment Company and First Aid Service Company, both in San Francisco, as new distributors.

Joshua Hendy Iron Works announce that the chief administrative offices of the Pomona Pump division have been moved to Sunnyvale, California, for a consolidation with the general administration of the company. Affected by the change are the sales, engineering, purchasing and accounting departments. Among the number of those moving their offices north are Arnold Brown, sales manager; A. W. Moon, advertising manager, and Ralph Linderman, export manager. All manufacturing activities will continue to be carried on in Southern California at Pomona and Torrance with Charles L. Barrett as plant manager for both.

Victor Equipment Company, with plant and executive offices at 844 Folsom Street, San Francisco 7, announce the opening of an Oakland sales and service store at 312-12th St., Zone 7. E. L. Russell, veteran Victor service engineer, has been named branch manager.

Saverite Engineering Company, of which W. H. ("Bill") Rudy is coast manager, have increased their manufacturing facilities by occupying a building at 3800 S. Hoover St., Los Angeles which will give them 30,000 square feet of floor space and a rail siding. New equipment for preparing some of their items has been installed. Other coast offices are in San Francisco, Chico, Portland, Seattle, and Anchorage, Alaska. Their line includes soot eradicators, boiler scale removers, refractory coatings and other power plant items.

Bill Rudy and his building





# THE SHOWCASE

43

**Sand Mullor**—The Mulbaro, a portable sand mullor designed to meet a host of specific mulling needs in small, medium and large size foundries. Its initial price is extremely low, no special engineering is necessary for installation and maintenance



costs are practically nil. Being portable the Mulbaro can operate in very small space in any part of the foundry. *Beardsley and Piper Company, Chicago, Ill.*

44

**Pneumatic Die Cushioning**—With the adoption of a pneumatic die cushion, one cushion for a given press can be applied to all the draw dies within the capacity of the given press; in all cases with the application of pneumatic die cushioning equipment a combination regulator and pressure gauge is used making it possible for the operator or tool designer to record the drawing holding pressure required and thus the piece part drawing or work record can be recorded accordingly. *Dayton Rogers Manufacturing Company, Minneapolis, Minn.*

45

**Hydraulic Lock Valves**—Production is announced of three new small size, lightweight, hydraulic lock valves. Designed for installation in aircraft to protect machine gun turrets and other vital controls against operation failures, the new valves lock hydraulic fluid in cylinders or hydraulic motors until the directional control valve is operated, thus maintaining pressure in the actuating mechanism. Valves may be obtained from various tubing size installations. *Adel Precision Products Corp., Burbank, California.*

46

**Electrode Holder**—The new Allison Electrode Holder is moulded of a high heat resistant plastic to insure full insulation and to completely eliminate all possibility of arcing due to slag, moisture, or contact with grounded surfaces. Made in two identical models—Model "A" is a 19 ounce unit built to handle heavy 300-500 ampere work, and Model "B", a 6 1/4 ounce holder for lighter 200 ampere jobs. *Allison Tool & Engineering Company, Los Angeles, California.*

47

**Flush Rivet Set**—Operators can safely and speedily drive rivets with one hand while installing the next rivet with the other hand using the Double EE Saf-T-Set. This new flush rivet set includes a protective rubber ring slightly higher than the driving surface which acts as a guard and eliminates the possibility of marring the riveted surface. The set is available with various face and shank diameters. *Emerson Engineering Company, Los Angeles, California.*

48

**Round Tool Bits**—Made either from Stellite 98M2 or Stellite Star J-Metal alloy, these round tool bits are furnished centerless-ground to tolerances of plus 0.000 and minus 0.002 in. on the diameter, and plus or minus 1/16 in. on the length, Stellite round tool bits are used on turning or boring operations, or can be ground into drills or reamers. *Haynes Stellite Company, Kokomo, Indiana.*

49

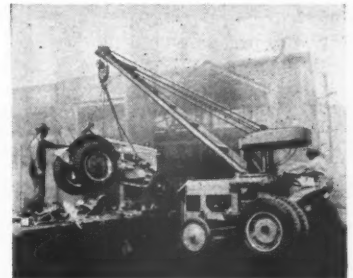
**Nozzle Tester**—Construction companies operating diesel-powered equipment will be interested in a compact, portable nozzle tester developed for use on fuel injectors. Among the advantages of this low-cost equipment are the speed and accuracy of the tests and the simplicity of operation. *Aircraft and Diesel Equipment Corporation, Chicago, Illinois.*

50

**Calculator**—The exclusive new "Handy Calculator" listed as number 18 in the July issue of *Western Industry* is available to craftsmen for 10 cents. *Greenlee Tool Co., Rockford, Illinois.*

51

**Tractor Crane**—Industrial Equipment Company of Emeryville, California, announce the volume production of their new Model D Handi-Crane, a full revolving tractor crane. Mounted on the Case Model DI tractor, it has a lifting capacity (based upon 75% of overturning load) ranging from 1,500 to 6,000 lbs., depending on boom angle and working radius. Standard boom length is 16 feet; longer booms, and special telescoping and goose-neck designs, are available on order. Designed primarily for fast, low-cost load handling, the new unit features high mobility and rapid, accurate control, with a turning radius of 15 feet and traveling speeds up to 15 m.p.h. All load stresses are carried by a heavy-duty welded steel frame bearing directly upon the tractor axles, relieving the tractor crankcase and transmission housing castings of all strains imposed by hoisting and transporting loads. Frame design permits easy access to tractor engine, and the regular tractor rear power take-off and drawbar are left clear



so the unit may be used for regular tractor work when not engaged in load handling. *—Industrial Equipment Company, Emeryville, California.*

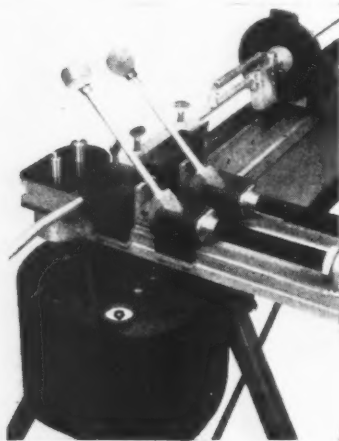
**Yessir!** I'm Interested in Anything New That Will Help Me Do a BETTER JOB.

**WESTERN INDUSTRY**  
503 Market Street  
San Francisco

Please send me information on the following items:.....

Name..... Title.....  
Company.....  
Address.....

**Tube Bender**—A new manually operated tube bender, which will produce 900 to 1000 bends per hour has been designed by the Douglas Aircraft Co. The Leonard-Douglas Bendmaster will handle non-ferrous tubing from  $\frac{3}{8}$  in. to  $1\frac{1}{4}$  in. O.D.,



producing from one to ten different bends in a single 9-ft. length of tubing. These bends can be produced to any specified degree of angle up to 180 degrees and at any radial angle. Special models for tubing up

to 20 ft. are available. Set-up time of the new machine averages 7 to 15 minutes. Manufactured by Leonard Precision Products Co., Garden Grove, California.

53

**Work-Handler**—A new "two-finger" open back work handler has been designed for general purpose hand protection. The hand pad is made of chrome tanned cowhide split leather. It carries a double thickness wearing surface across the entire palm and over the side and back of the forefinger where so much severe wear comes. All seams are sewed with steel thread making the guard practically rip proof. The open back construction means a cool, comfortable, flexible fit. Adjustable fastener at the wrist is another added feature for comfort to the wearer. Industrial Gloves Company, Danville, Illinois.

54

**Cable Splicing Rig**—The new Gar-Bro Cable splicing rig is a structurally self-contained unit designed to facilitate all the necessary operations in the splicing of cable. Equally useful as a portable or as a permanent installation. The overall size, set up, is 96 inches by 45 inches. The weight is 250 lbs., approximately, and no section weighs more than 100 lbs.—Garlinghouse Brothers, Los Angeles, Calif.

55

**Transparent Shades**—Contributing considerably to the productivity of workers during summer months by preventing eye strain and fatigue, these shades have proven to be a cheap, efficient way to keep weather and production under control; they are durable and non-inflammable. No harsh sunlight or glare to hurt the eyes, no excessive heat to cause let-downs and weariness.—Transparent Shade Company, Los Angeles, California.

56

**Steel Stools**—The former complete line of Lyon stools are again available for sale to industrial users. Only exception: rubber feet will not be available. Priorities required for the delivery of stools are AA-5 or better, the same as for other steel shop-equipment. Stools are available with or without adjustable backs, and with or without pressed wood seats.—Lyon Metal Products, Inc., Aurora, Illinois.

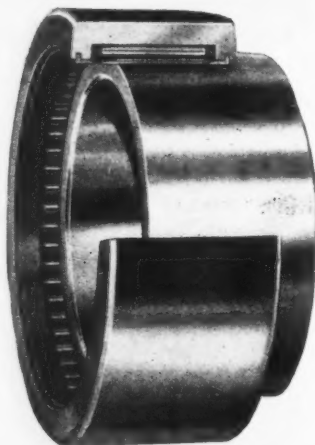


## BEARINGS

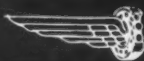
FOR EVERY *Industrial* NEED..

AMERICAN  
HEAVY  
DUTY  
ROLLER  
BEARINGS

Write  
for  
Bulletin



**EDWARD D. MALTBY CO.**



1718 SOUTH FLOWER STREET  
LOS ANGELES, CALIFORNIA  
TELEPHONE RICHMOND 5285  
PHOENIX OFFICE - 448 W. MADISON STREET - TELEPHONE 3-3789

*Good News!*



**A 1-MAN CREW  
CAN MAINTAIN  
YOUR FLOORS**

WITH

**SPEED PATCH**

★Your plant . . . any plant can keep their floors in tip-top condition with SPEED PATCH. No need to employ a number of men for the job (even if you could get them). No sir! Just equip one man with a tamper and SPEED PATCH, and he will keep your floors in A-1 condition.

The reasons why Speed Patch will reduce your floor maintenance crew to one man, are found in the product itself. Because Speed Patch comes factory prepared with nothing else to add, anyone can make expert repairs. It's fool proof. Simply fill the broken area with Speed Patch and tamp solid. Pass heaviest trucks over the patch immediately—no waiting—requires no time to set or dry. Use indoors or outside. Makes a spark-proof, load-proof patch that will last indefinitely.

We urge you . . . order SPEED PATCH and let one man smooth out your dangerously broken floors.

Send Your Order Today—Immediate Shipments!

**ROCK-TRED CORPORATION**

629 W. Washington, Chicago 6, Ill.  
WARREN & BAILEY CO., 350 SOUTH ANDERSON STREET, LOS ANGELES  
PETERSON-COBBY CO., 363 CLEMENTINA STREET, SAN FRANCISCO

# YOURS FOR THE ASKING

1498

**Fastener Catalog**—New fastener catalog F covers cap screws, set screws, aircraft bolts, nuts and other fastener items. Thumb indexed for convenient reference, the catalog lies flat when open. It includes complete dimensions and weights. *The Cleveland Cap Screw Company, Cleveland 4, Ohio.*

1499

**Bureau of Ideas**—A bulletin outlining the Suggestion System on a national scale, a bureau of ideas that has been instrumental in saving literally millions of dollars for its users. *Morton Manufacturing Company, Chicago, Ill.*

1500

**Automotive Maintenance Equipment**—An interesting booklet is available explaining the Tivit portable spray tank which simplifies cold removal of grease, oil and soil. Complete instructions are given to make cleaning easy. *Tivit Products Company, Los Angeles, California.*

1501

**Aluminum**—An "Aluminum Imagineering Notebook" lists 12 economic advantages of aluminum—it is an interesting and helpful handbook for anyone engaged in postwar activities. *Aluminum Company of America, Pittsburgh 19, Pa.*

1502

**Electric Trucks**—Baker Electric Truck Catalog No. 52, is a 20-page handbook of information on material handling with power trucks, designed to facilitate selection of the proper equipment for any set of requirements. *The Baker Industrial Truck Division, The Baker-Raulang Company, Cleveland 13, Ohio.*

1503

**Searchray**—A new bulletin is issued describing Searchray which enables you to see things you never saw before. Searchray gives all the benefits of X-ray analysis without the expense of lead-lined rooms. Easy to install—easy to operate and easy to make radiographs. *Searchray Model 150, North American Philips Co., Inc., New York, N.Y.*

1504

**Boring and Facing Machine**—An informative bulletin (G-B-12) describes the GEMCO machine which is particularly adaptable for performing facing operations on surfaces not usually accessible to standard machine tools. *General Engineering & Mfg. Co., St. Louis, Mo.*

1505

**Electronic Products**—A timely booklet prepared to give a picture of how the manufacturers of Norelco Electronic Products expect to serve industry in the postwar future following Victory. *North American Philips Company, Inc., New York.*

1506

**Aids for Placing Veterans**—A 500-page volume entitled "Special Aids for Placing Military Personnel in Civilian Jobs" is to be used in 1500 local offices of the U. S. Employment Service and will be available to employers and others interested. The purpose of the volume is to indicate how military experience and training of veterans may be utilized in a return to civilian life. *Government Printing Office, Washington, D.C.*

1507

**Panelboard Conversion Plan**—An interesting 16-page pamphlet, CA-575, describing unique method of converting obsolete and inadequate electric light and power panelboards to full efficiency and modernness without disturbing the box or conduit is available upon request. *Square D Company, Los Angeles, Calif.*

1508

**Solution Coating**—A new technical bulletin describes the GEON vinyl chloride polymers and copolymers, in resin as well as plastic form, for calendar and solution processing. The bulletin discusses mixing and milling, calendering and the general aspects of solution coating with the resins. *Chemical Division of The B. F. Goodrich Company, Akron, Ohio.*

1509

**Welding**—"Theory of Soldering, Brazing and 'Low Temperature' Welding" is the theme of a new four-page folder which tells how the Eutectic process was discovered. It explains what happens when the Eutectic welding alloy is deposited on the parent metal at low temperatures. *Engineering Department, Eutectic Welding Alloys Company, New York.*

1510

**Refrigeration and Air Conditioning**—A new catalog of accessories and supplies for refrigeration and air conditioning plants has just been issued. The book is designed to give quick, complete "finger-tip" information—is the loose leaf type, divided into sections and tabbed for ready reference. Available on request via business letterhead. *York Corporation, York, Pennsylvania.*

1511

**Position Welding**—Information on position welding and a description of the complete Ransome line of welding positioning equipment is featured in a 40-page, two-color bulletin, No. 2152. *Ransome Machinery Company, Dunellen, New Jersey.*

1512

**Socket Screw Products**—Complete data on Western socket head cap screws, set screws, stripper bolts, pipe plugs, hexagon keys and special socket screws is available in a new 32-page catalog issued by *Western Automatic Machine Screw Co., Elyria, Ohio.*

1513

**Dryers**—The technique of drying is dealt with in complete detail in a new catalog descriptive of equipment and plants designed for that purpose. Bulletin No. 1958. *Blaw-Knox Company, Pittsburgh, Pa.*

1514

**Income Tax**—An explanatory summary of the individual income tax act of 1944 with alternative tax table—surtax rates, and comparative schedules of estate and gift tax rates is available from *Aaron, Davis & Wood, Certified Public Accountants, San Francisco.*

1515

**Sump Tank Cleaning**—Sump tanks cleaned in less than 10 minutes of all sludge, chips, oil and coolant. Circular available about the new Model 20-T. *W. R. Carnes Company of Madison, Wisconsin.*

1516

**Gas Turbines**—Two technical publications on gas turbines are available for those who wish to know relationships of thermo-dynamics, pressures and temperatures, operating characteristics, fuel economy and applications. GED1099—"The Basic Gas Turbine Plant and Some of its Variants" and GED1090—"Gas Turbines and Turbosuperchargers." *General Electric Company, San Francisco.*

1517

**Gas Engine Generator Sets**—A complete, composite unit that produces power to operate electric industrial trucks, tractors, cranes, and industrial locomotives. Ready-Power replaces storage battery and charging equipment and insures long life with a minimum of mechanical difficulties. Bulletin No. 99 describing the gas electric power plant for electric truck operation is available from *Karl Moellendick, distributor for Ready-Power, Huntington Park, California.*

1518

**Worm Gear Units**—Catalog No. 300 is a comprehensive exposition of Speedaire fan-cooled worm gear reduction units. The Speedaire principle is fully detailed by means of cutaway photographs, charts, diagrams and engineering tables. Besides explanatory and descriptive material, the design engineer will find carefully detailed instructions for planning installations of Speedaire units, with illustrative examples. *The Cleveland Worm & Gear Company, Cleveland, Ohio.*

1519

**Industrial Trucks**—Electric Truck Catalog No. 52 gives a comprehensive picture of the complete standard line of Baker power industrial trucks and an answer to your material handling problem. *Baker Industrial Truck Division, Cleveland, Ohio.*

1520

**Bendmaster**—Eight-page bulletin fresh off the press covering the newly developed Leonard-Douglas Bendmaster. *Leonard Precision Products Co., Garden Grove, Calif.*

1521

**Structural Steel Flooring**—A book of complete, up-to-the-minute information on open steel grating and stair threads has just been issued by *Wm. F. Klemp Company, Chicago, Illinois.*

1522

**V-Belt Drives**—An interesting 44-page handbook on industrial fractional horsepower V-belt drives, giving prices and data on both sheaves and belts, has just been published by *The B. F. Goodrich Company, Akron, Ohio.*

You owe it to yourself to keep posted—only the efficient business survives under the strain and pressure of the war effort. Literature listed in these columns may be just the answer to your need for greater production, substitute materials or knowledge of how to care for your equipment. Just drop a note to Western Industry, 503 Market St., San Francisco, and copies will be forwarded to you. If you do not use business letterheads, please name your company affiliation.



1523

**"Infra-red" Gas Burners**—A new 114-page catalog describing the Burdett "Infra-Red" principle gas burners and combustion equipment is available to distributors and industrial sales engineers upon request and written on their company stationery. The book contains much valuable information as well as engineering and reference material. *Burdett Mfg. Co., Chicago, Illinois.*

1524

**Sawing Machine**—The new DoALL Zephyr high speed friction cutting machine is now described and illustrated in a four-page bulletin being distributed by the manufacturers. Pictures show the convenience of operation and safety factors of this all-purpose sawing machine. *Continental Machines, Inc., Minneapolis, Minn.*

1525

**Index for Small Plants**—A new index, covering a library of diversified technical, research, production, marketing and management problems is now available. The index lists several hundred problems that have already been solved through the *Technical Advisory Service*. The complete library is available for reference purposes in the *Smaller War Plants Corporation Regional Office, San Francisco.*

1526

**Operadio**—"The Operadio Bulletin" is a new development to inform dealers, sound service men and industrial music outlets of Operadio war production for the Army and Navy and sales developments for the Commercial Sound Division. Interesting trends related to electronics are frequently stressed in this newsletter published by the *Operadio Manufacturing Co., St. Charles, Illinois.*

1527

**"Supervisory Management"**—In a 27-page pamphlet published by a 24-man committee, members of which represent industries across the country from California to Massachusetts, suggestions resulting from a series of NAM meetings on supervisory problems are given. Foremen from war production plants were specifically invited to contribute their practical knowledge and express their views. *National Association of Manufacturers, San Francisco, New York and Washington, D.C.*

1528

**Regulators**—Engineers and welding department heads will be interested in a new bulletin illustrating the design and construction features of certain types of Victor single and two-stage reduction regulators employed in the welding industry. Copies are available upon request. Specify Form 40. *Victor Equipment Company, San Francisco, Calif.*

1529

**Lubrication Systems**—A 16-page booklet, printed in three colors, graphically portrays the theory and practice of mechanical lubrication; tells how centralized lubrication systems increase the production output of machinery and at the same time make impressive savings in time, power and lubricating materials. Bulletin No. 25, newly published by *The Farval Corporation, Cleveland, Ohio.*

1530

**Diesel Engines**—Power users interested in knowing the reasons for the flexibility and dependability of "Caterpillar" Diesel engines will find a concise, simple explanation in booklet No. D43, just issued by *Caterpillar Tractor Co., Peoria, Illinois.*

1531

**Plastic Board**—A new bulletin (No. 6) describes and illustrates Walesite, a laminated lignin plastic board, used in Wales plate sets and for Wales hole punching units set up on template mountings. Physical properties of this material, which is adaptable for use with Wales hole punching equipment, are fully described. *Wales-Strippit Corporation, North Tonawanda, New York.*

1532

**Windup Machine**—A four-page engineering folder describes the constant-tension windup machine for wire, cable, rubber, tapes, fabrics and other continuous materials. *The Industrial Oven Engineering Company, Cleveland, Ohio.*

1533

**Fractional Horse-Power Motors**—"Out of Thin Air" is a new brochure prepared to tell something of the story of strides made in the design of fractional horsepower motors since the beginning of the war. Product designers will be interested in the possibilities suggested and in the application of quality control. *The Dumore Company, Racine, Wisconsin.*

1534

**Aircraft Heater**—A six-page form (3-44) gives engineering specifications for the "Janitrol" aircraft heaters which are built on the whirling flame principle. The bulletin includes

drawings, diagrams, pictures of standard models, sketch, sheet and data sheet. *Surface Combustion, Toledo, Ohio.*

1535

**Vapor Degreasing**—A new complete manual on Vapor Degreasing has just been released and should be of great interest to anyone concerned with industrial solvents and degreasing in any way. The book is a source of much valuable information and gives a factual presentation of the subject. *Phillips Manufacturing Company*

1536

**Plastic Compound**—A new folder is just off the press on "Toolite . . . a Thermosetting Phenolic Plastic for casting tools, dies and fixtures." It explains the properties, characteristics and procedures of "Toolite," a new ready-compounded plastic for tooling. *Adbere, Inc., Los Angeles, Calif.*

1537

**Circuline Collectors**—The completion of a new 24-page illustrated data book No. 1982 has been announced in which photographs, dimensions, capacity tables, and other pertinent engineering data are given for a new sludge collector for the smaller-diameter settling tanks known as Type "B," recommended for tanks up to 55-ft. diameter. Installations of Type "A" collectors in tanks up to 115-ft. diameter are also illustrated. *Link-Belt Company, San Francisco, Calif.*

## INDEX TO ADVERTISERS THIS ISSUE

	Page		Page
Beatty Steel Products Co.	66	Lubriplate Division	
California Barrel Company, Ltd.	3rd Cover	Fiske Bros. Refining Co.	49
California Spring Company, Inc.	54	Maas, A. R., Chemical Co.	52
Carboloy Company, Inc.	20	Maltby, Edward D., Company	80
Chain Belt Company	6	Marine Engineering & Supply Co.	74
Chicago Eye Shield Company	70	Marwood, Limited	46
Cleveland Tramrail Division		McCortly Company, The	8
Cleveland Crane & Engineering	42 & 43	McGill Manufacturing Co.	59
Colby Steel & Engineering Co.	13	Meyer, Wilson & Geo., Co.	65
Coldwell, Banker & Company	73	Oakite Products, Inc.	71
Colson Equipment & Supply Co.	18	Pacific Screw Products Corp.	50
Consolidated Steel Company	16	Payne Furnace & Supply Co.	67
Crane Company	22	Pioneer Rubber Company, The	62
Crocker First Nat'l Bank	65	Plant Rubber & Asbestos Works	17
Downs Crane & Hoist Company	62	Premier Oil & Lead Works	51
Durant Manufacturing Company	75	Punch-Lok Company	66
Empire Construction Company	57	Rapids-Standard Company	64 & 71
Engineering Products Company	58	Ridge Tool Company	75
Fairbanks, Morse & Company	24	Rock-Tred Corporation	80
Farval Corporation, The	64	Saverite Engineering Company	77
Fishstrom Sales Company	78	Smoot-Holman Company	60
Friden Calculating Machine Co.	45	Square "D" Company	47
Fruehauf Trailer Company	10	Standard Oil Company	26
Goodall Rubber Company	72	Stauffer Chemical Company	44
Greenberg's, M., Sons	73	Stephens-Adamson Mfg. Co.	4th Cover
Gruendler Crusher & Pulverizer Co.	76	Stuart Oxygen Company	67
Harper, H. M., Company	72	Sylvania Electric Products, Inc.	12
Hendy, Joshua, Iron Works	55	Tide Water Associated Oil Co.	63
Independent Pneumatic Tool Co.	7 & 21	Timber Structures, Inc.	14
Isaacson Iron Works	74	Union Oil Company	11
Johns Manville Corporation	41	United Autographic Register Co.	53
Johnston, A. P., Company	65	Victor Equipment Company	2nd Cover
Kobe, Incorporated	19	Walworth California Company	56
Link-Belt Company, The	9	Warman Steel Casting Co.	23
Littlejohn-Reuland Corporation	70	West Disinfecting Company	61
Los Angeles Standard Rubber Co.	65	Western Asbestos Company	4
Los Angeles Steel Casting Co.	76	Western Gear Works	15
Lowe-Stoddard Company	77	Westinghouse Electric & Mfg. Co.	3
		Wrigley, Jr., William, Co.	48

d model  
Combin  
  
e man  
eased  
concern  
ing in  
uable  
tation  
Comp  
  
s just  
mosett  
s and  
acterist  
eady-con  
Inc., L  
  
tion of  
1982  
s, dim  
inent  
udge  
ing tan  
tanks  
type  
meter  
San Fran  
  
UE  
Page  
49  
52  
80  
74  
46  
8  
59  
65  
71  
50  
67  
62  
17  
51  
66  
8 & 71  
75  
80  
77  
60  
47  
26  
44  
Cover  
67  
12  
63  
14  
11  
53  
Cover  
56  
23  
61  
4  
15  
3  
48  
  
r, 1944



## It used to be a nail keg, now it's a CABCO allbound box



The question of which makes the better seat is not important. This Cabco Allbound Box is a nailless box for shipping nails and it has gone a long way toward breaking the tradition of the old nail keg which stood by the stove at the

corner store in bygone days.

These modern shipping containers have definite advantages whether you are shipping nails or nectarines. They are factory made complete in one piece. You need no hammer, nails or special machinery to prepare your

shipment. You can open and close them with your bare hands. They possess great strength because they are bound together with steel wire . . . yet they are extremely light in weight because they are made of wood veneer.

Whatever your product the chances are excellent that you'll save by shipping it in Cabco Allbound Containers. You can quickly ascertain the facts by submitting your problem to Cabco Engineers. Because of the war it may be difficult to supply you containers today but, now is the time to plan your post-war shipping. No cost or obligation, of course.

# CABCO

ALLBOUND Crates and Boxes

**CALIFORNIA BARREL COMPANY, Ltd.**

100 BUSH STREET  
SAN FRANCISCO 4  
CALIFORNIA

2581 E. EIGHTH STREET  
LOS ANGELES 23  
CALIFORNIA

501 DOOLEY BUILDING  
SALT LAKE 1  
UTAH

**WESTERN INDUSTRY**503 MARKET STREET  
SAN FRANCISCO, CALIF.

FORM 3547

**POSTMASTER:**If addressee has removed, notify  
sender on Form 3547, postage for  
which is guaranteed.  
503 Market Street, San FranciscoSEC. 562, P. L. &  
U. S. POSTAGE**PAID**San Francisco, Calif.  
Permit No. 4167

IT TAKES THE

*Right  
Equipment  
Used  
Right***TO ASSURE MAXIMUM  
HANDLING EFFICIENCY**

The head end of an S-A Skip Hoist handling coal in a power plant. The skip bucket is in its top position, where it can be seen discharging coal into the large storage bin.

Wherever materials handling plays such an important part in the overall operation picture, it deserves special consideration by management, and a periodic review of existing methods.

Coal handling and ash removal are operations to which Stephens-Adamson has devoted special attention through its extensive work with power plants throughout the Nation.

These handling problems, of course, vary

greatly from plant to plant. To meet the variety of requirements, S-A manufactures a *complete* line of correctly designed conveying and elevating equipment, including all related accessories.

In addition, S-A has a staff of expert engineers to assemble machinery units into successful conveying and elevating systems. To be sure you have the *right equipment* laid out in the *most efficient method*, contact S-A on your handling problems.

582 Market St., San Francisco 4, Cal.  
1208 Western Ave., Seattle 1, Wash.**STEPHENS-ADAMSON MFG. CO.**

2227 E. 37th ST., LOS ANGELES 11, CALIF.

214 Duane Street, Salt Lake City  
1007 E. Barnside St., Portland 11



L. & E.  
STAGE

D

e. Cal.  
4167

ip bed  
rage b